FINAL

RECORD OF DECISION

MARCH AIR FORCE BASE/AIR RESERVE BASE
OPERABLE UNIT 2
AIR FORCE RESERVE COMMAND SITES 1, 11, 37, and 39

September 2005

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LIST OF ACRONYMS

1,2-DCA	1,2-dichloroethane
AFB	Air Force Base
AFBCA	Air Force Base Conversion Agency
AFHQ	Air Force Headquarters
AFRC	Air Force Reserve Command
AFRPA	Air Force Real Property Agency
AMC	Air Mobility Command
ANG	Air National Guard
ARARs	Applicable or relevant and appropriate requirements
ARB	Air Reserve Base
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
COPC	Chemical of Potential Concern
DTSC	Department of Toxic Substances Control
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
FFA	Federal Facilities Agreement
IRIS	Integrated Risk Information System
HEAST	Health Effects Assessment Summary Tables
HI	Hazard Index
HQ	Hazard Quotient
MCLs	Maximum Contaminant Levels
mg/kg	milligrams per kilogram
NAWQC	National Ambient Water Quality Criteria
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbon
PCBs	Polychlorinated biphenyls
POL	Petroleum, Oil and Lubricants
PRGs	Preliminary Remediation Goals
RAB	Restoration Advisory Board
RCRA	Resource Conservation Recovery Act
PPRTVs	Provisional Peer-Reviewed Toxicity Values

RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SAC	Strategic Air Command
SARA	Superfund Amendments and Reauthorization Act
TCE	Trichloroethene
TPHs	Total Petroleum Hydrocarbons
TSDF	Treatment, Storage and Disposal Facility
UCL	Upper Confidence Limit
UST	Underground Storage Tank
UV	Ultraviolet

DECLARATION

D.1 SITE NAME AND LOCATION

Air Force Reserve Command Sites 1, 11, 37 and 39 in Operable Unit 2
March Air Reserve Base
Riverside County, California

D.2 STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial actions for certain Operable Unit 2 (OU2) sites controlled by the Air Force Reserve Command (AFRC) at March Air Reserve Base (ARB), Riverside County, California. AFRC developed this Record of Decision (ROD), hereinafter referred to as the AFRC OU2 Sites 1, 11, 37 and 39 ROD in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), [40 Code of Federal Regulations (CFR), Part 300]. This decision document is based on information contained in the Remedial Investigation/Feasibility Study (RI/FS) report for OU2 dated July 1997 and the administrative record for March AFB.

The AFRC OU2 sites addressed in this ROD are in areas that are being retained by the Air Force Reserve Command. The remaining OU2 sites are controlled by either AFRC or the Air Force Real Property Agency (AFRPA), formerly known as the Air Force Base Conversion Agency (AFBCA), and are addressed in a separate document.

This AFRC OU2 Sites 1, 11, 37 and 39 ROD documents the Air Force's selection of remedial alternatives to address soil contamination at four Environmental Restoration Program (ERP) sites on March ARB that were contaminated with substances such as fuels, oils, and solvents during the earlier years of base operations. March ARB is the portion of the former March AFB that is being retained by the AFRC. The Air Force and the U.S. Environmental Protection Agency (EPA) Region IX selected these remedies in concurrence with the California Department of Toxic Substances Control (DTSC) and the Regional Water Quality Control Board, Santa Ana Region (RWQCB, Santa Ana Region), under guidelines established in the Federal Facilities Agreement (FFA), signed on 27 September 1990 by representatives of EPA Region IX; DTSC; RWQCB, Santa Ana Region; and the Air Force.

D.3 ASSESSMENT OF THE SITES

The response actions selected in this ROD are necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment in accordance with CERCLA §104(a).

D.4 DESCRIPTION OF THE SELECTED RESPONSE ACTIONS

Three OUs have been established at March ARB. Categorization of OUs was based primarily on geographical location and similarities in contaminant types and distribution. OU1 consists of groundwater and soil sites on the east side of the base grouped together by the similarity of contaminants (primarily trichloroethene [TCE]) and commingling of groundwater contaminant plumes migrating southeastward off base. OU1 consists of fourteen sites, Sites 4, 5, 7, 9, 10, 13, 14, 15, 16, 18, 29, 31, 34 and 38. OU3 consists of a single site, fuel contamination from the Panero Aircraft Fueling system. OU3 has been removed from the CERCLA program and the fuel cleanup is being overseen by the RWQCB. OU2 contains the other soil and groundwater sites identified at the time the OUs were established. Fifteen OU2 sites are contained the AFRPA OU2 ROD, Sites 3, 6, 12, 17, 19, 20, 22, 23, 24, 25, 26, 30, 35, 40 and 42. Two OU2 sites, Site 8 and 36 will be in a separate

document This separate document will also address the Volatile Organic Compounds (VOC) contamination in the area of OU3. Sites 2 and 27 are petroleum release sites and will be handled in Remedial Action Plans with the RWQCB, Santa Ana Region See Sections and 4 for a more complete discussion. The off-base OU1 groundwater contamination as well as soil contamination in other OU1 sites was addressed in the OU1 ROD dated June 1996. The size and concentration of contaminants in the off-base OU1 groundwater plumes are monitored on a regular basis. Other groundwater contamination detected on the Main Base has been addressed in the Decision Document for OU3.

The response actions discussed in this ROD address the documented principal public health and environmental threats associated with the four AFRC sites identified as ERP Sites 1, 11, 37, and 39. The locations of these sites are shown in Figure D-1, Location of OU2 Sites 1, 11, 37 and 39, and a brief site description is included in Table D-1, Site Status Summary.

TABLE D-1
SITE STATUS SUMMARY
AFRC-CONTROLLED OU2 SITES

Site No.	Description	Interim Removal Action Performed	Further Active Soil Cleanup Action Required*	Further Active Groundwater Cleanup Action Required*	Remedial Action Required
1	Aircraft Isolation Area	Yes	No	No	Yes (Land Use Controls only)
11	Bulk Fuel Storage Area	No	No	No	Yes (Land Use Controls only)
37	Building 317 PCB Spill	Yes (at time of spill, prior to ERP)	No	No	No
39	Abandoned Gas Station	Yes	No	No	No

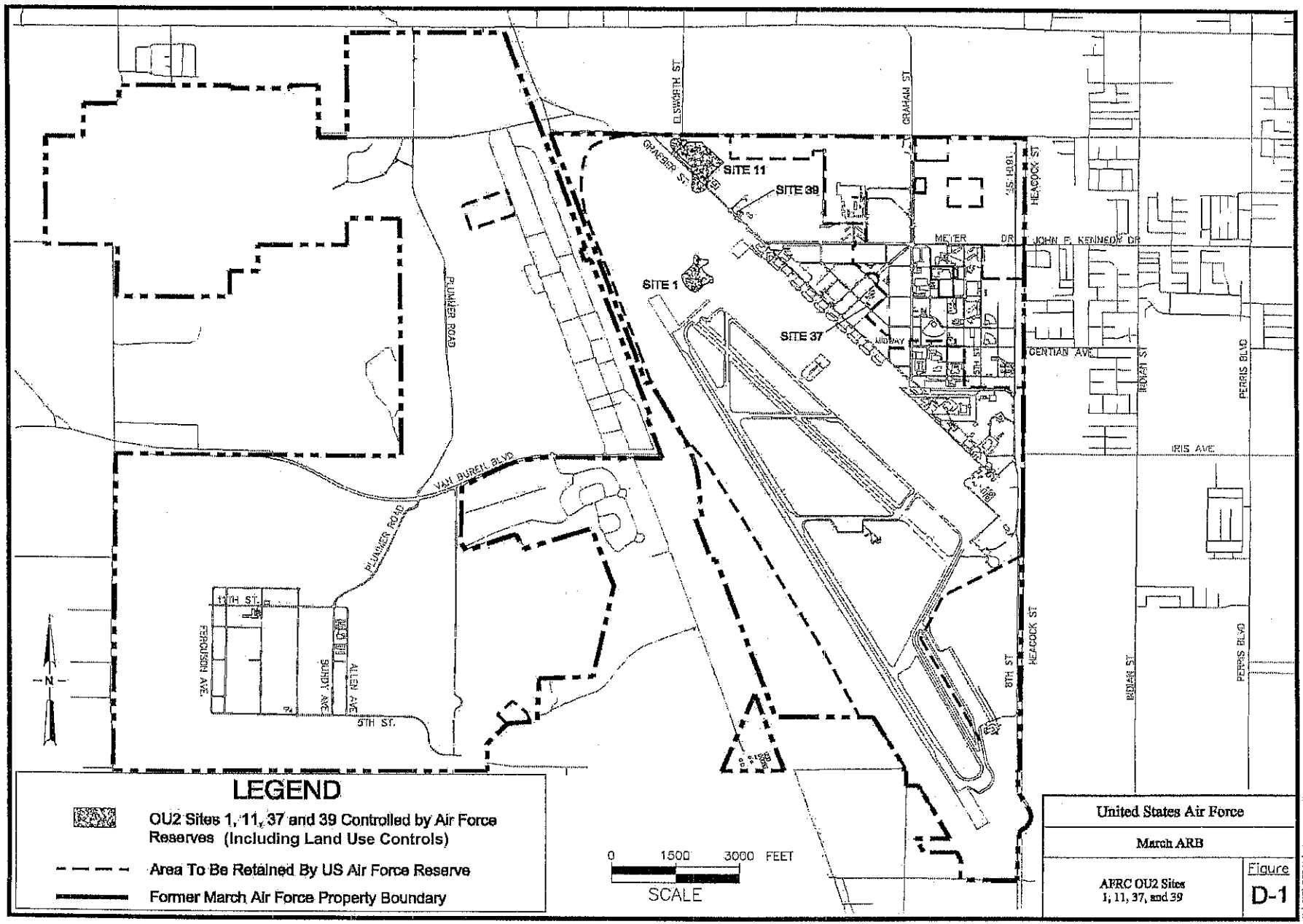
* Not including Land Use Controls

Interim removal actions have been performed at three sites to mitigate potential risk to human health and the environment from contaminated soils. These include Sites 1, 37, and 39. Removal actions have reduced contaminant concentrations to levels that will allow unlimited use and unrestricted exposure at Sites 37 and 39.

For the two remaining sites (1 and 11), the Air Force evaluated remedial alternatives. The remedial alternatives evaluated are shown in Table D-2.

TABLE D-2
REMEDIAL ALTERNATIVES EVALUATED

Cleanup Alternative	Description
No Action	Federal regulations require the use of this alternative as a starting point for comparing the other alternatives.
Land Use Controls	Under this alternative, various restrictions will be imposed on the use of the property as well as exposures and activities at the site. The restrictions would prevent use of the property that would result in unacceptable health risk.
Excavation and Low-Temperature Thermal Desorption	Soils are excavated and heated to volatilize contaminants. The volatized contaminants are destroyed by high temperatures.
Excavation and Off-base Landfill Disposal	This alternative involves excavation of contaminated soil and disposal at a designated Treatment, Storage, and Disposal Facility (TSDF).


SITE 11
SITE 39
SITE 1
SITE 37
GRACIER ST
GRAHAM ST
HEACOCK ST
MEYER DR
JOHN F. KENNEDY DR
PLUMMER ROAD
VAN BUREN BLVD
CERTIAN AVE
IRIS AVE
PERRIS BLVD
INDIAN ST
8TH ST
9TH ST
FERGUSON AVE
SUNNY AVE
ALLEN AVE
N
0 1500 3000 FEET
SCALE
LEGEND
OU2 Sites 1, 11, 37 and 39 Controlled by Air Force Reserves (Including Land Use Controls)
Area To Be Retained By US Air Force Reserve
Former March Air Force Property Boundary
United States Air Force
March ARB
AFRC OU2 Sites 1, 11, 37, and 39
Figure D-1

Subsequent to the evaluation of alternatives, the Air Force and EPA selected a remedy for the two sites. The remedies are summarized in Table D-3 and discussed further in the following sections. Detailed descriptions of the selected remedies for each site are provided in Section 9 of this ROD.

TABLE D-3
SELECTED REMEDIAL ALTERNATIVES

Site No.	Description	Soil or Water	Selected Alternative
1	Aircraft Isolation Area	Soil	Land Use Controls
		Water	No Action Required
11	Bulk Fuel Storage Area	Soil	Land Use Controls
		Water	No Action Required
37	Building 317 PCB Spill	Soil and Water	No Action Required
39	Abandoned Gas Station	Soil and Water	No Action Required

Site descriptions, including site history and primary contaminants encountered, performance standards and summaries of risk assessments and the selection of remedial alternatives, are provided in Sections 5 through 9 of this ROD. The performance standards for groundwater are the Maximum Contaminant Levels (MCLs). Preliminary Remediation Goals (PRGs) and risk assessments were used to determine the performance standards for soil.

A variety of applicable cleanup methods were evaluated for each site requiring remediation. A preferred alternative was selected based on a variety of factors, including cost, for each site. A summary of selected alternatives is provided below on a site-specific basis. Five-year reviews for Sites 1 and 11 to ensure the continued protection of human health and the environment will be required because hazardous substances will remain above health-based levels, as specified in CERCLA and the FFA.

SOIL CONDITIONS AND CLEANUP METHODS

Sites Requiring No Further Action – Soil

Interim removal actions were conducted at two sites, 37 and 39. Residential cleanup standards allowing unrestricted site use were attained and no further action is necessary to ensure protection of human health and the environment.

Sites Requiring Land Use Controls

Land Use Controls are selected for two sites (1 and 11) with residual contamination, including Site 1 where a removal action has occurred.

Site 1 – Aircraft Isolation Area. Elevated levels of polycyclic aromatic hydrocarbons (PAHs) were found in surface soils. In December 1995, a time-critical removal action was conducted where approximately 3,200 cubic yards of affected soil were removed from the site and placed in the Site 6 waste cell (see AFRPA ROD for a further discussion of Site 6). Confirmation soil samples were collected from the base of the excavation and surrounding undisturbed area. The results of the excavation confirmation sampling confirmed that industrial cleanup levels were achieved and therefore an industrial

land use is appropriate and acceptable. Land Use Controls prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds, and limit the access to authorized personnel will be recorded in the Base Comprehensive Plan/Base General Plan (2004 or latest version) along with the reason for restrictions (elevated PAHs). The AF will make the land use control sections of the current and any revised Base Comprehensive Plan/Base General Plan available to regulatory agencies upon request. Unapproved use and activities will be prevented by the digging permit program procedures and construction review process described in Section 7.1.

Whenever the Air Force transfers real property that is subject to institutional controls and resource use restrictions to another federal agency, the transfer documents shall require that the federal transferee include the institutional controls, and applicable resource use restrictions, in its resource use plan or equivalent resource use mechanism. The Air Force shall advise the recipient federal agency of all obligations contained in the ROD, including the obligation that a State Land Use Covenant will be executed and recorded pursuant to 22 CCR Section 67391.1 in the event the federal agency transfers the property to a non-federal entity.

Whenever the Air Force proposes to transfer real property subject to resource use restrictions and institutional controls to a non-federal entity, it will provide information to that entity in the draft deed and transfer documents regarding necessary resource use restrictions and institutional controls, including the obligation that a State Land Use Covenant will be executed and recorded pursuant to 22 CCR Section 67391.1. The signed deed will include the specific institutional controls and resource use restrictions, consistent with the State Land Use covenant and this ROD.

Whenever the Air Force plans one of the transfers described above, it will, whenever possible, notify and consult with EPA and DTSC six months before such transfer to ensure that the transfer process and documents address institutional controls and resource use restrictions. If it is not possible to notify and consult with EPA and DTSC six months in advance, the Air Force shall do so as soon as possible, but not later than sixty days before transfer of such property.

Site 11 – Bulk Fuel Storage Area. Elevated levels of a PAH were found in the surface soil. Concentrations of the PAHs were found to be within acceptable risk values for industrial land use but were above residential levels. Land Use Controls will prohibit future residential-type use and limiting the access to authorized personnel and will be recorded in the Base Comprehensive Plan/Base General Plan (2004 or latest version) along with the reason for restrictions (elevated PAHs). The AF will make the land use control sections of the current and any revised Base Comprehensive Plan/Base General Plan available to regulatory agencies upon request. Unapproved use will be prevented by the digging permit program procedures and construction review process described in Section 7.1 of this ROD.

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D.5 STATUTORY DETERMINATION/DECLARATION

The releases at Sites 11 and 39 have been determined through the remedial investigation to involve petroleum product releases from an above ground jet fuel tank and below ground gasoline tanks, respectively. Such releases are excluded from the CERCLA definitions of hazardous substances, pollutants, and contaminants (42 USC § 9601 (14) and (33)). Such releases are covered by and subject to the State Underground Storage Tank Law Title 23, California Code of Regulations, Division 3, Chapter 16. 23 CCR Section 2721, Health & Safety Code (H&SC) Section 25295 of Chapter 6.7, and 40 CFR 280.67 for underground storage tanks and California Aboveground Petroleum Storage Action with 1991 Amendments - H&SC Section 25270 - 25270.13 for aboveground tanks authorizes the RWQCB to utilize the substantive and procedural processes and requirements of another federal or state law in lieu of this law if it determines that such law provides equivalent human health and environmental protection and public participation and the agency agrees/concurs with the remedy selected under the other legal regime. The State of California has made this determination and has concurred with the remedy selected in this ROD.

The selected remedies for soil (Land Use Controls for Sites 1 and 11) are protective of human health and the environment. The remedies comply with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action and are cost effective.

The selected remedy for Sites 1 and 11 does not utilize permanent solutions or alternative treatment technologies, but appropriately balances those considerations with relative costs and other relevant criteria.

The remedy for Sites 1 and 11 does not satisfy the statutory preference for treatment as a principal element of the remedy. The residual contamination remaining after the removal action cannot be practically removed and treated. Treatment is not necessary or warranted. Therefore, limiting exposures by Land Use Controls is appropriate.

The selected remedy for Sites 1 and 11 achieves the objective of preventing exposures while allowing industrial use of the site. The selected remedy satisfies the long-term effectiveness criteria by ensuring no exposure over levels protective of human health. The selected remedy does not present short-term risk and there are no implementability issues.

The effectiveness of the remedial actions selected in this ROD will, at a minimum, be reviewed at five year intervals to assure that the remedy continues to adequately protect human health and the environment and is achieving cleanup standards. Once cleanup standards that allow for unlimited use and unrestricted exposure have been achieved, the Five Year Review will no longer apply to those actions because hazardous substances will not remain above health-based levels.

Due to previous interim removal actions conducted at Sites 37 and 39, there are no remaining unacceptable risks to human health or the environment, and therefore no further action is necessary or warranted.

D.6 ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary:

- Chemicals of concern and their respective concentrations (Sections 5 and 6)
- Baseline risk represented by the chemicals of concern (Section 6)
- Cleanup levels established for chemicals of concern and the basis for these levels (Section 9)
- Current and reasonably anticipated future land-use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (Section 5 and 6)
- Potential land and groundwater use that will be available at the sites as a result of the selected remedy (Section 9)
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs; discount rate; and number of years over which the remedy costs are projected (Section 7)
- Key factors which led to selecting the remedy (Sections 7, 8 and 9)

Additional information can be found in the administrative record, which is on file and available at March ARB Portions of the administrative record are also available on the internet at the following website address: **https://afrpaar.afrpa.pentagon.af.mil/docsearch/newdocsearchform.asp**

AUTHORIZING SIGNATURES

This AFRC OU2A Sites 1, 11, 37 and 39 ROD may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document The undersigned authorized representative has selected the remedies in conjunction with the U S EPA and approves the Record of Decision for Sites 1, 11, 37, and 39, March ARB, California.

Signature

9/26/05
Date

JAMES T RUBEOR, Brig Gen, USAFR
Commander

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This AFRC OU2 Sites 1, 11, 37 and 39 ROD may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document. The undersigned authorized representative has co-selected the remedies and concurs with the Record of Decision for Sites 1, 11, 37, and 39, March ARB, California.

Kathleen H. Johnson

Signature

9/30/05

Date

Kathleen H. Johnson, Chief
Federal Facilities and Site Cleanup Branch
U.S. Environmental Protection Agency, Region IX

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This AFRC OU2 Sites 1, 11, 37 and 39 ROD may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document The undersigned authorized representative concurs with the Record of Decision for Sites 1, 11, 37, and 39, March ARB, California.

Signature
John E. Scandura, Chief
Southern California Branch
Office of Military Facilities
Department of Toxic Substances Control
California Environmental Protection Agency

9/29/05
Date

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This AFRC OU2 Sites 1, 11, 37 and 39 ROD may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document. The undersigned authorized representative agrees with the remedy selection for Sites 1 and 11. The undersigned authorized representative concurs with the Record of Decision for Sites 1, 11, 37, and 39, March ARB, California.

Signature

Gerard J. Thibeault, Executive Officer
California Regional Water Quality Control Board
Santa Ana Region

9/30/05
Date

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1.0 SITE NAME, LOCATION, & DESCRIPTION

March Air Force Base (AFB) is located at the northern end of the Perris Valley, east of the city of Riverside, in Riverside County, California. March AFB (the Base) is approximately 60 miles east of Los Angeles and 90 miles north of San Diego (Figure 1-1). The Base lies in sections of Township 3 South, Range 4 West and covers portions of the Riverside East, Steele Peak, and Sunnymead, California quadrangle maps. The Base is bisected by Interstate 215 (I-215) in a northwest-southeast direction. The section to the east of the freeway is commonly referred to as the Main Base, and the section to the west is referred to as West March.

The 7,123-acre March AFB has been used for aircraft maintenance and repair, refueling operations, and training activities since 1918. In compliance with the 1990 Defense Base Realignment and Closure Act, March AFB was divided into two entities on March 31, 1996. The Air Force Reserve Command (AFRC) retained approximately 2,300 acres for continued military use. The remainder was transferred to the Air Force Base Conversion Agency (currently known as the Air Force Real Property Agency [AFRPA]) for eventual disposal. In 1980, the Installation (now Environmental) Restoration Program (ERP) was developed by the Department of Defense/Air Force as the mechanism for the CERCLA (42 U.S.C. Section 9601) process, incorporating applicable Resource Conservation and Recovery Act (RCRA) regulations as well as meeting requirements of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) (40 CFR Part 300). The Air Force initially conducted a Phase I records search of 30 potentially contaminated ERP sites on Base. There are now a total of 44 ERP sites at the former March AFB and current March Air Reserve Base (ARB). Contaminants in both soil and groundwater at March ARB include aromatic hydrocarbons, chlorinated solvents, fuels, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). Contamination by PAHs and PCBs appears to be restricted to surface and near-surface soils whereas fuel hydrocarbons and solvents tend to be predominant contaminants in subsurface soils and groundwater.

The lead agency for cleanup at March AFB is the Air Force. It consists of the AFRC and AFRPA. Only the former is involved in this ROD document. The U.S. Environmental Protection Agency (EPA), the California Department of Toxic Substances Control (DTSC), and the California Regional Water Quality Control Board (RWQCB), Santa Ana Region are all support agencies for cleanup activities at the Base. The Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) identification number for the Base is CA4570024527.

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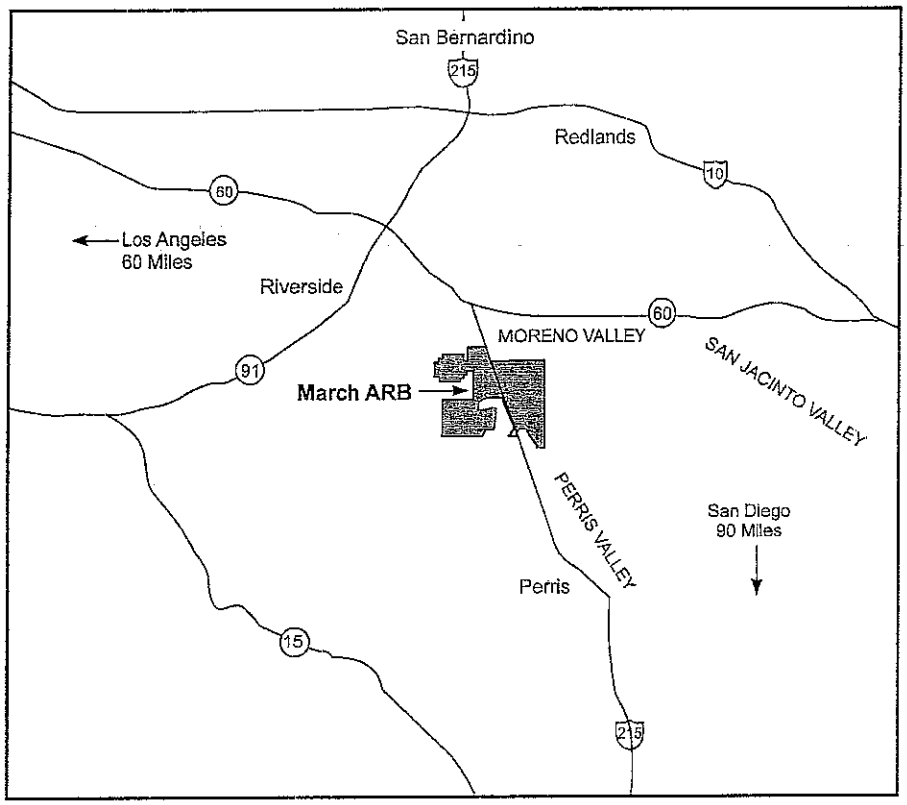

United States Air Force	
March ARB	
Location of March Air Reserve Base	Figure 1-1

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2.0 SITE HISTORY & ENFORCEMENT ACTIVITIES

March AFB opened on March 1, 1918, as the Alessandro Aviation Field. The 640-acre facility was used during World War I as a training center for Curtiss JN1 "Jenny" aircraft pilots. After World War I, March AFB closed for about four years and reopened in 1927. By 1938, March AFB was considered the central location for bombing and gunnery training on the West Coast. During World War II, Camp Haan Army Base was constructed along the west side of I-215 (then Highway 395) Camp Haan extended from Alessandro Boulevard south along the Highway to Nandina Avenue and to Barton Street to the west approximately 3 to 4 miles. Camp Haan was used primarily as an anti-aircraft artillery camp and staging area for General Patton's tank force. At one time, as many as 80,000 personnel were reportedly stationed at Camp Haan. After World War II, a portion of Camp Haan became a part of March AFB. In 1949, the Strategic Air Command (SAC) assumed control of the Base. In June 1991, March AFB became an Air Mobility Command (AMC) installation, with primary missions of air refueling and cargo airlifts From that time until realignment in 1996, the Base served as a main location for bombers as well as refueling and cargo aircraft In addition, the AFRC and California Air National Guard (ANG) units are operating cargo and fighter missions at the Base at this time.

In 1993, the Base Closure and Realignment Commission designated March AFB for realignment, resulting in the transfer, by April 1996, of most active duty Air Force personnel and aircraft to Travis AFB, California. AFRC and California ANG units remained, and a portion of the Base was redesignated as March ARB. Due to realignment, substantial areas of the Base (particularly at West March) are being transferred to civilian and other agencies, decreasing the 1993 area of the March AFB by about two-thirds. The current March ARB boundary, the areas to be retained by the Air Force, and areas designated for transfer are discussed in Section 4.0.

The Air Force at March AFB and elsewhere has long been engaged in a wide variety of operations involving the use, storage, and disposal of hazardous materials, including fuel and solvents. Past waste disposal practices, although in compliance with legal requirements in existence at that time, have resulted in contamination of soil and groundwater at several areas on the Main Base and on West March.

In 1980, the Department of Defense/Air Force developed the Installation (now Environmental) Restoration Program (ERP) to address soil and groundwater contamination at Air Force Bases nationwide. The ERP process at March AFB began in 1983 with a records search that included interviews with Base personnel and research of Base records and historic aerial photographs. The records search identified 30 potentially contaminated sites and recommended further investigation of most of those sites. Since then, numerous investigations have been conducted to delineate contaminants in the soil and groundwater. There are currently 44 ERP sites at March ARB, four of which are being addressed in this AFRC ROD for OU2.

In 1989, EPA placed March ARB on the National Priorities List (NPL), as a result of documented groundwater contamination by chlorinated solvents and other contaminants. In September 1990, the Air Force entered a Federal Facilities Agreement (FFA) with the EPA and the State of California to facilitate the assessment and cleanup process. The FFA establishes procedures for involving federal and state regulatory agencies as well as the public in the restoration process at March AFB

A remedial investigation/feasibility study (RI/FS) was performed at OU2 sites between 1992 and 1997 The main objectives of the RI/FS were to collect additional data to confirm contaminant source areas, to delineate contaminant boundaries, to assess potential risks to human health and the environment, and to evaluate remedial alternatives for soil and groundwater cleanup.

The Agency for Toxic Substances and Disease Registry conducted a Public Health Assessment, starting in 1991 The Final Public Health Assessment (March 13, 2001) found no apparent public health hazard.

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3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The public review process is the means by which the public may provide input into the decision-making process and is a critical component of the remedy selection process. Public participation requirements as defined in CERCLA §117 and NCP §300.430(f)(3) have been met as detailed in the paragraphs below.

The public participation was complicated by several changes to how OU2 is documented. A summary of the changes is presented in the Table 3-1.

Table 3-1

OU2 Changes

Date	Document	Description
July 1997	OU2 RI/FS	The Remedial Investigation/Feasibility Study for all the OU2 Sites.
September 1997	OU2 Proposed Plan	The Proposed Plan for all the OU2 Sites. The associated ROD for this Proposed Plan was never completed. Because of delays in completing the ROD and the need to have a completed ROD for the sites that are not be retained by the Air Force (AFRPA sites), the ROD document was split.
August 2000	OU2 Proposed Plan, AFBCA Sites	Proposed Plan for the AFRPA (formerly AFBCA) OU2 Sites. The associated ROD for this Proposed Plan was signed in May 2004.
August 2003	OU2 Proposed Plan, AFRC Sites	Proposed Plan for AFRC Sites 1, 2, 8, 27, 36, 37 and 39. The associated ROD for this Proposed Plan was never completed. Because additional work is required on some of the AFRC sites prior to completing the ROD, this ROD document was prepared for Sites 1, 11, 37 and 39. The remedies in this ROD are the same as in the Proposed Plan.

3.1 Previous Efforts

The Draft OU2 RI/FS report on all the OU2 sites was released to the public on November 4, 1996, followed by the Proposed Plan on all the OU2 sites on September 8, 1997. This Proposed Plan will hereinafter be referred to as the 1997 OU2 Proposed Plan. These two documents were listed in the Administrative Record and taken to the information repositories at the Moreno Valley Library and Chamber of Commerce. The notice of

availability of these documents was published in the Press-Enterprise, the main local newspaper, on September 5, 1997. A fact sheet, condensed from the 1997 OU2 Proposed Plan, was sent to all persons on the March AFB mailing list, which includes Restoration Advisory Board (RAB) members in May 1998.

The public comment period for the 1997 OU2 Proposed Plan was held from September 8 to October 8, 1997. In addition, a public meeting was held on September 9, 1997. Representatives of the Air Force, EPA, DTSC, and RWQCB, Santa Ana Region, attended the public meeting to address questions about the OU2 RI/FS and the 1997 OU2 Proposed Plan. The Responsiveness Summary for this 1997 public comment period is included in Appendix A of the two draft OU2 RODs, produced in February 1998 and November 1998, both of which are part of the Administrative Record. Neither of these RODs was finalized or signed.

Public participation requirements are in CERCLA §117 and NCP §300.430(f)(3). The requirements were met for this ROD.

Following issuance of the 1997 OU2 Proposed Plan, OU2 was split into two parts, one for sites outside the cantonment area and one for sites inside the cantonment area (retained by the Air Force). This separation of the RODs is intended to expedite the transfer of AFRPA-controlled land to the community. Programmatic issues within the Air Force headquarters and the passage of time have not done anything to compromise the process. The sites outside the cantonment area are the responsibility of the AFRPA.

3.2 AFRPA OU2 Proposed Plan

An OU2 Proposed Plan for the AFRPA sites was prepared in mid 2000. The AFRPA OU2 Proposed Plan covering Sites 3, 6, 12, 17, 19, 20, 22, 23, 24, 25, 26, 30, 35, 40, and 42, which was produced in its entirety, as a fact sheet, was sent to all persons on the March AFB/ARB mailing list. The public comment period for the AFRPA OU2 Proposed Plan was held between August 23 and September 22, 2000. A public meeting was held on September 13, 2000 on the 2000 OU2 Proposed Plan. Representatives of the Air Force, EPA, and California DTSC attended the public meeting to address questions about the AFRPA OU2 Proposed Plan.

3.3 AFRC OU2 Proposed Plan

Similarly, an OU2 Proposed Plan for the AFRC sites was made available to the public in August 2003. It was sent to all persons on the March AFB/ARB mailing list. A notice of availability was published in the Riverside Press Enterprise on August 25, 2003. The public comment period was held from August 25 to October 8, 2003. In addition, a public meeting was held on September 18, 2003 to present the Proposed Plan to a broader community audience than those that had already been involved at the site. Representatives of the Air Force and EPA attended the public meeting to address questions about the AFRC OU2 Proposed Plan.

3.4 Current Conditions

A separate OU2 ROD has been prepared for the AFRPA sites. The AFRPA OU2 ROD was finalized and executed on 17 May 2004. This document is the ROD for Sites 1, 11, 37, and 39, all located inside the cantonment area, as directed by HQ USAF/ILEVR (HQ USAF/ILEVR memorandum, 25 Aug 04). A separate ROD document will be prepared for OU2 Sites, 8, and 36, also located inside the cantonment area. This separate document will also address the Volatile Organic Compounds (VOC) contamination in the area of OU3. Sites 2 and 27 are petroleum release sites and will be handled in Remedial Action Plans with the RWQCB, Santa Ana Region.

A response to comments made on the September 2003 AFRC OU2 Proposed Plan received during this public comment period is included in the Responsiveness Summary, contained in this AFRC OU2 Sites 1, 11, 37 and 39 ROD (Appendix A). This AFRC OU2 Sites 1, 11, 37 and 39 ROD presents the remedial actions for the OU2 AFRC sites, located at March ARB, California. Remedial actions were selected in accordance with the NCP and CERCLA, as amended by Superfund Amendments and Reauthorization Act (SARA). Documents

relating to the selection of remedial actions for OU2 AFRPA sites at March AFB are listed in the Administrative Record Index, provided in Appendix B. Public participation in the decision-making process for OU2 AFRPA sites complied with the requirements of CERCLA §113(k)(2)(B)(i-v), 117, and the NCP 40 CFR §300 430(f)(3).

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4.0 SCOPE & ROLE OF OPERABLE UNIT 2 – AFRC SITES

Operable Unit 2 (OU2) is one of three Operable Units established at former March AFB. OU2 was created before the Base realigned and has subsequently been split into two parts, one covering the sites to be retained by the Air Force (AFRC sites) and one covering sites that are not being retained (AFRPA sites)

The decision to divide the OU2 ROD into two parts was driven by the realities of base realignment at the former March AFB, which occurred in March 1996. This Congressional Act led to the division of responsibility for cleanup at the Base. The retained land (cantonment area) is the AFRC's responsibility, while lands to be excessed are the responsibility of the AFRPA. While these two entities are part of the corporate Air Force; funding, management and overall missions of the two Air Force entities are significantly different.

At March AFB, aircraft maintenance, fuel storage operations, fire-training exercises, and regular Base operations have generated a variety of hazardous wastes. Past waste disposal practices have contaminated soil and groundwater in several areas on the Base. In 1989, March AFB became a Superfund site when it was added to EPA's NPL, encompassing 40 separate sites (Figure 4-1). As with many Superfund sites, the contamination issues at March AFB are complex. As a result, the work has been organized into operable units.

Categorization of OUs was based primarily on geographical location and similarities in contaminant types and distribution. The location of OU1, OU2, and OU3 sites are shown in Figure 4-1

OU1 encompassed Sites 4, 5, 7, 9, 10, 13, 14, 15, 16, 18, 29, 31, 34, and 38. Sites 21 and 23 were initially included in OU1, but Site 23 was transferred to OU2, and Site 21 will be addressed in another Decision Document. OU1 also includes the off-base portion of the groundwater plume at the eastern Base boundary. A ROD was issued for OU1 in June of 1996 which addresses: 1) soil at Sites 10, 15, 18, 31 and 34; and 2) groundwater at Sites 4, 18 and 31 and the combined OU1 groundwater plume

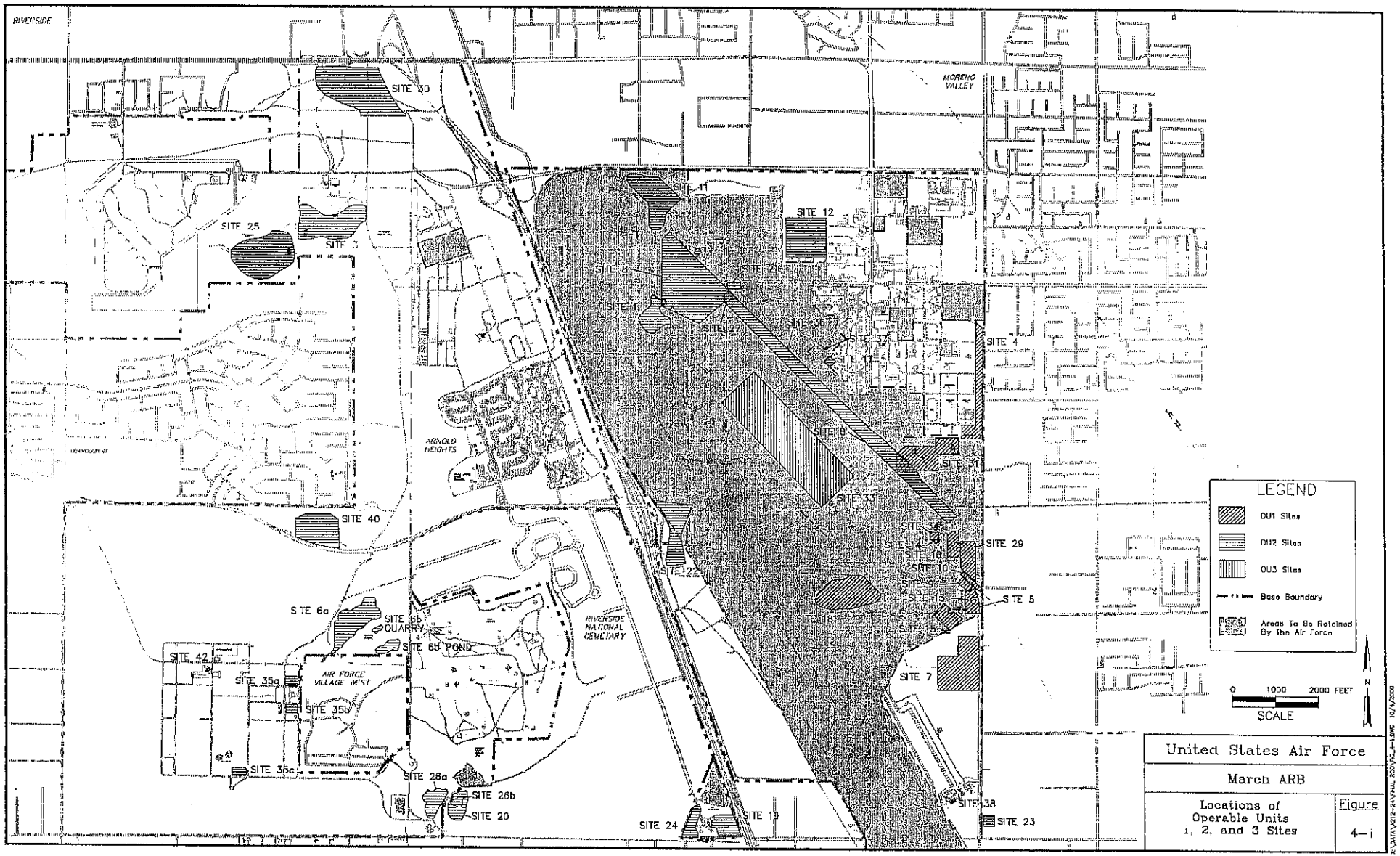
OU2 originally included Sites 1, 2, 3, 6, 8, 11, 12, 17, 19, 20, 22, 23, 24, 25, 26, 27, 28, 30, 32, 35, 36, 37, 39, 40, 41 and 42. Sites 28 and 32 were originally listed in the FFA as OU2 sites. Site 28 was a network of monitoring wells (28MW1 through 28MW10) dispersed throughout the Main Base. Since Site 28 was not an identified source of contamination, a separate investigation for Site 28 was not required. Site 32 was loosely described as areas of construction debris for which locations were not specified. Several specific construction debris sources were identified at some OU2 sites, such as Sites 17, 20, and 30. No other specific locations were identified for inclusion in the RI/FS, and further investigation of Site 32 was not required.

An OU2 RI/FS was performed at OU2 sites between 1992 and 1997. The main objectives of the OU2 RI/FS were to collect additional data to confirm contaminant source areas, to delineate contaminant boundaries, to assess potential risks to human health and the environment, and to evaluate remedial alternatives for soil and groundwater cleanup. In February 1998, a draft ROD was issued for all of the OU2 sites to meet the FFA deadline, followed by a draft final OU2 ROD in November 1998. However, the Air Force has separated the OU2 ROD into an AFRPA ROD, this AFRC OU2 ROD (for Sites 1, 11, 37, and 39) and will issue a separate AFRC ROD for the remaining AFRC OU2 sites. Separating the AFRPA and AFRC sites was done to expedite the transfer of property to the community for AFRPA-controlled land. In addition, Land Use Controls are handled differently on land that is transferred out of government control. Separating the AFRPA and AFRC sites to separate RODs would facilitate the review and approval process

This AFRC OU2 Sites 1, 11, 37 and 39 ROD addresses four of the eight OU2 sites controlled by the AFRC (Sites 1, 11, 37, and 39 [Figure D-1]). The sites included in this document are in areas that are being retained

by the Air Force A listing of the sites and the agency controlling each site is provided in Table 4-1. A summary of the current status of the OU2 sites addressed in this document is included in Table 4-2.

The remaining sites not in OU1 or OU2 include Site 33, 43, and 44. Site 33 is the Panero Aircraft Fueling System that comprised OU3, which has been addressed in a separate Decision Document. Sites 43 and 44 will be addressed in a separate AFRPA Decision Document.



United States Air Force

March ARB

Locations of Operable Units 1, 2, and 3 Sites

Figure 4—1

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TABLE 4-1
OU2 SITES

Site No.	Description	Controlling Agency
1	Aircraft Isolation Area	Air Force Reserve Command – in this document
2	Waste Oil Tanks/Solvent Pits	Air Force Reserve Command – separate Remedial Action Plan
3	Landfill No. 5	Air Force Real Property Agency
6	Landfill No. 4	Air Force Real Property Agency
8	Flightline Shop Zone	Air Force Reserve Command – later ROD document
11	Bulk Fuel Storage Area	Air Force Reserve Command – in this document
12	Civil Engineering Yard	Air Force Real Property Agency
17	Swimming Pool Fill	Air Force Real Property Agency
19	West March Sludge Drying Beds	Air Force Real Property Agency
20	Landfill No. 7	Air Force Real Property Agency
22	Landfill No. 2	Air Force Real Property Agency
23	East March Effluent Pond	Air Force Real Property Agency
24	Landfill No. 1	Air Force Real Property Agency
25	Munitions Residue Burial Site	Air Force Real Property Agency
26	Water Treatment Sludge	Air Force Real Property Agency
27	Building 422 Underground POL Tanks	Air Force Reserve Command – separate Remedial Action Plan
28[1]	Main Base Monitoring Well Network	Air Force Reserve Command – see note 1
30	Construction Rubble Burial Site	Air Force Real Property Agency
32[2]	Construction Debris Areas	Air Force Real Property Agency
35	15th Air Force Headquarters Leaking Underground Storage Tanks	Air Force Real Property Agency
36	Building 458 Leach Pit	Air Force Reserve Command – later ROD document
37	PCB Spill at Building 317	Air Force Reserve Command – in this document
39	Abandoned Gas Station	Air Force Reserve Command – in this document
40	Landfill No. 8	Air Force Real Property Agency
41	Hawes Site	Air Force Real Property Agency [3]
42	Building 3404 Transformers	Air Force Real Property Agency

Notes: [1]Investigated by potential source areas such as Site 2 and Site 8. Required remedial action for these sources is provided under the site containing the source, no separate action required for Site 22.
[2]No additional construction debris disposal locations could be identified for RI.
[3] Site 41 will be discussed in a separate decision document.
POL = Petroleum, oil, and lubricants

TABLE 4-2
SITE STATUS SUMMARY
OU2 SITES CONTROLLED BY AFRC

Site No.	Interim Removal Action Performed	Remedial Action Required
1	Yes	Yes (Land Use Controls only)
11	No	Yes (Land Use Controls only)
37	Yes	No, unrestricted land use
39	Yes	No, unrestricted land use

5.0 SUMMARY OF SITE CHARACTERISTICS

5.1 OU2 Characteristics

The following sections present a brief overview of the AFRC OU2 characteristics. Detailed information is presented in Section 1 of the OU2 RI/FS.

5.1.1 Groundwater

Depth to groundwater is approximately 35 to 45 feet below ground surface. The groundwater level has risen approximately 10 to 15 feet since 1993 and continues to rise at the rate of 1-2 feet per year. The groundwater flow direction changes at Site 2. South of Site 2, the flow is to the south. North of Site 2, the flow is to the north.

OU2 is located in the Perris-North Groundwater Management Zone, which is within the jurisdiction of the RWQCB, Santa Ana Region (Region 8). The RWQCB Region 8 Basin Plan establishes the following beneficial use classifications for groundwater in the Perris North Sub-basin.

- Municipal and Domestic Supply: Present or Potential Use
- Agricultural Supply: Present or Potential Use
- Industrial Service Supply: Present or Potential Use
- Industrial Process Supply: Present or Potential Use

Specific water quality objectives for groundwater in the Perris-North Groundwater Management Zone are also given in the Basin Plan for a variety of water quality parameters. For toxics, it is specified that groundwater in the sub-basin shall be maintained free of substances in concentrations which are toxic, or that produce detrimental physiological responses in human, plant, animal or aquatic life. A more detailed discussion of the above use designations and the Perris-North Groundwater Management Zone water quality objectives is given in the Region 8 Basin Plan.

5.1.2 Surface Water/Surface Runoff

There are no surface water bodies on the AFRC OU2 sites. Surface water runoff goes into the base storm water drainage system, which flows to the southeast. The site topography is flat with a gentle grade to the south. Site 39 is completely paved; Site 37 is completely grass. Sites 1 and 11 are a combination of paving, buildings, grass and bare dirt.

The base storm water drainage system then discharges into the Perris Valley Storm Drain, a tributary of the San Jacinto River. The base storm water drainage system discharge into the Perris Valley Storm Drain is subject to a NPDES permit

The Perris Valley Storm Drain is within the jurisdiction of the RWQCB Region 8. The RWQCB Region 8 Basin Plan establishes the following beneficial use classifications for the San Jacinto River and its tributaries in this area.

- Municipal and Domestic Supply: Excepted from this use
- Agricultural Supply: Intermittent Beneficial Use

- Groundwater Recharge: Intermittent Beneficial Use
- Water Contact Recreation: Intermittent Beneficial Use
- Non-contact Water Recreation: Intermittent Beneficial Use
- Warm Freshwater Habitat: Intermittent Beneficial Use
- Wildlife Habitat: Intermittent Beneficial Use

Specific water quality objectives for the San Jacinto River and its tributaries in this area are also given for a variety of water quality parameters. For toxics, toxic substance shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health, and the concentrations of toxic pollutants in the water column, sediments or biota shall not adversely affect beneficial uses. In Region 8 inland surface waters, the concentrations of toxic contaminants in waters which are existing or potential sources of drinking water also shall not occur at levels which are harmful to human health, but this criteria does not apply to this reach of the San Jacinto River since it is excepted from this use. A more detailed discussion of the above use designations and the San Jacinto River water quality objectives is given in the Region 8 Basin Plan.

5.2 Site Characteristics

The following sections present a brief overview of the site characteristics of the four sites of concern for this AFRC OU2 Sites 1, 11, 37 and 39 ROD. Detailed information is presented in Section 3 of the OU2 RI/FS.

5.2.1 Site 1 – Aircraft Isolation Area

Site 1 is next to the northern taxiway connecting the primary runway to the aircraft parking apron. During the early 1960's fuel was reportedly removed from aircraft into portable tanks for transfer to other parts of the base. Reportedly, some of the fuel was drained directly to the ground. Chlorinated solvents such as trichloroethene (TCE) may have also been disposed of in this area.

Site sampling found no significant amounts of fuel or solvents, but elevated levels of PAHs were found in the surface soil. PAHs are chemicals that are formed from the burning of organic compounds and are a major component of asphalt. In December 1995, a time-critical removal action was conducted where approximately 3,200 cubic yards of affected soil were removed from the site and placed in a Site 6 waste cell. This is documented in Action Memorandum, Removal Action, SS-01, Admin Record number 552; Closure Report, Immediate Removal Action, SS-01, Admin Record number 668 (this was the excavation and sampling of Site 1); and Modification to the Site Specific Removal Action, SS-01, SD-09, WP-25, and 12 UST Locations, and Consolidation of LF-06, Admin Record number 581. Confirmation soil samples were collected from the surrounding undisturbed area. Due to the results of the excavation confirmation sampling, existing concentrations of PAHs were found to be within acceptable values for industrial land use. The results are discussed in Section 6, Summary of Site Risks.

Following soil removal, a large portion of the site was graded for construction of the new California ANG alert facility. The facility has been completed and is in operation. No change to the current industrial land use is planned.

5.2.2 Site 11 – Bulk Fuel Storage Area

Site 11 is the tank farm area of approximately 20 acres in the northeast corner of the Base near the main gate. The site includes the entire fuel storage facility and smaller portions to the northwest and southeast. The fuel storage facility is enclosed by a fence with a locked gate. The site has been used as a storage and distribution facility for jet fuel since the early 1950s. A 1949 aerial photograph indicates that portions of the site were previously occupied by a motor-pool parking and storage area.

The site was investigated due to concerns about releases from historic site (such as motor pool use in the 1940s) as well as the current site use (fuel farm). A 10,000-gallon surface spill of fuel occurred in 1976 as the result of a transfer-valve malfunction.

Site sampling found elevated levels of a PAH in the surface soil, no significant amount of fuel contamination (evaporation removes a fraction of fuel spilled on the surface) and no significant groundwater contamination was found. Concentrations of the PAH were found to be within acceptable risk values for industrial land use but exceed residential levels. The results are discussed in Section 6, Summary of Site Risks. No change to the current industrial land use is planned.

5.2.3 Site 37 -- PCB Spill at Building 317

Site 37 is a former transformer area. It is located in a landscaped grass area adjacent to Building 317.

Following reports of a transformer oil spill in 1983, PCBs were detected at concentrations of 7.8 and 2.1 milligrams per kilogram (mg/kg) in soils surrounding the transformer pad. The 4-foot by 8-foot pad was removed. Subsequently, 7 cubic yards of soil to a depth of 1 foot were excavated. Confirmation samples indicate measurable PCBs remain on site. Records of the soil removal and confirmation sampling are incomplete

The site was re-sampled and small amounts of PCBs were found. No other contaminants were found. The small amounts are within the acceptable risk range for unrestricted use. The results are discussed in Section 6, Summary of Site Risks.

Since this was a surface spill of limited quantity and PCBs are practically insoluble, groundwater investigation was not required. Based upon the results of the site investigation and risk assessment, no further action is necessary at this site Although cleanup has achieved residential land use levels at Site 37, no change to the current industrial land use is planned.

5.2.4 Site 39 – Abandoned Gas Station

Site 39 is a former Base Exchange gas station. Use of the station reportedly ceased in 1979. The gas station office, Building 2406, has been converted into a US Post Office.

Four 10,000-gallon underground gasoline storage tanks were removed in the presence of two representatives from the County of Riverside Department of Health Services on July 11, 1991. The tanks were reportedly in good condition, but some soil discoloration and staining of the soils in the vicinity of the tank was observed during excavation activities. Fuel from the supply lines connected to the tanks had apparently leaked into the soil, causing the soil staining Subsequent soil sampling indicated the presence of fuel related contaminants in the site soils. The pumps and pump island have also been removed.

Soil concentrations were within acceptable risks to human health. However, remedial action was conducted to mitigate potential leaching of contaminants into underlying groundwater. The fuel-contaminated soil was treated by bioventing from February 1999 to December 1999. A soil boring was completed in June 2000 and confirmed the soil cleanup was complete. Cleanup was conducted under the principal oversight of RWQCB, with assistance provided by EPA Region IX and DTSC. The cleanup of the former petroleum UST release was not subject to CERCLA jurisdiction.

Groundwater sampling found small levels of contaminants, primarily 1,2-Dichloroethane (1,2-DCA). The small amounts of contaminants are within the acceptable risk range for unrestricted use. The soil analytical results confirmed that cleanup to residential levels was achieved. Based upon the results of the site investigation and risk assessment, no further action is necessary at this site. Although cleanup has achieved residential land use levels at Site 39, no change to the current industrial land use is planned. EPA Region IX, DTSC, and RWQCB, Santa Ana Region, concur with the no further action alternative. The results are discussed in Section 6, Summary of Site Risks.

6.0 SUMMARY OF SITE RISKS

The baseline risk assessment estimates what risks Sites 1, 11, 37 and 39 pose if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessment for the four sites of concern in this AFRC OU2 Sites 1, 11, 37 and 39 ROD.

A baseline human health risk assessment was conducted for the AFRC OU2 sites using data collected during the OU2 RI. The human-health evaluation methodology is provided in the Administrative Record (Section 2 of the final RI report for these sites). Ecological risk was also evaluated. The Main Base (i.e. cantonment) areas are highly developed, primarily comprised of landscaping, buildings and/or pavement. These areas offer habitat to very few wildlife species compared to the open areas of rural West March. Routine Main Base activities are also likely to disturb the majority of wildlife. As a result, it is mutually agreed upon between the Air Force, DTSC, and EPA that ecological assessments would be conducted for ERP sites located on West March (i.e., outside of the cantonment) only.

6.1 Baseline Risk Assessment

6.1.1 Baseline Risk Assessment Methodology

During the OU2 RI, the Air Force considered the potential human health risks associated with the sites. The baseline risk assessment for these sites was performed using both current and future industrial/construction worker and future residential scenarios. At the request of the EPA and DTSC, the Air Force evaluated the residential land use scenarios as a "standard" part of baseline risk assessments. These residential risk assessments were intended to demonstrate whether the property at each IRP site could be considered for future unrestricted site use and, therefore, closed under a no further action determination. Although none of the IRP sites were considered likely to be used for residential purposes in the future, determination of acceptable risks for residential uses would potentially prevent the necessity for placing Land Use Controls on the property. The results also provide the information necessary for the Air Force (or future property owners) to determine what types of actions are necessary to achieve unrestricted use, assuming unacceptable residential risks were estimated. The Air Force, in consultation with EPA, and the State of California, conducted the risk assessments in accordance with EPA guidance (Risk Assessment Guidance for Superfund). It was assumed future residents and workers could be exposed to chemicals of potential concern detected in surface soils. Accidental ingestion and incidental dermal contact with surface soil (0 to 2 feet) were therefore considered to be potentially complete exposure pathways and were selected for quantitative evaluation, as appropriate. Because DTSC is concerned with the surficial redistribution of near-surface soils during residential development, it was conservatively assumed that future residents may also contact chemicals of potential concern detected in soils up to 10 feet deep.

During future site development, construction workers may be exposed to chemicals in soils. The Air Force, in consultation with EPA and the State of California, conformed with DTSC guidance (Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities). It was conservatively assumed that future construction workers

may be exposed to chemicals measured in either surface soils (0 to 2 feet) or near surface soil (0 to 10 feet). The specific soil interval used in the exposure analysis depended on the determination of exposures and risks to future residents. The data from the more substantially affected soil interval (i.e., highest risk to residents) was used in evaluating exposures to future construction workers.

As described in the RI, the groundwater basin is a potential potable water source. A residential use scenario was assumed for the groundwater pathway to accommodate its designation by RWQCB as having a potential future beneficial use as a municipal and domestic water supply. Thus, potential future residential exposure to chemicals of potential concern in groundwater was selected for quantitative evaluation, including ingestion of groundwater, dermal contact with water during bathing or showering, and inhalation of vapors emitted from water during showering. Future residential groundwater exposures were evaluated for onsite residents. It was assumed that offsite residential exposures (if groundwater is used at offsite locations) would be identical to those for onsite residents.

Chemicals in soil can migrate to the atmosphere through volatilization or suspension of soil particles. Chemicals that may be involved in both of these processes may be detected in soil and soil gas samples. The presence of a receptor who might inhale the resulting airborne compounds would complete the air exposure pathway.

Airborne dust may be dispersed to offsite locations such as the nearby industrial workers and residents. They may inhale the airborne dust and thereby be exposed to the chemicals released from soils. Future onsite workers and residents may also inhale fugitive dusts from surface soils, thereby completing the inhalation exposure route. Workers involved with future construction operations may also be exposed to dust generated by excavation or other soil handling activities. If excavated soils were redistributed at the surface, DTSC has indicated a concern for future residents being exposed to the compounds in the soils. Inhalation of airborne dusts was, therefore, identified as a potentially complete exposure pathway. Quantitative evaluation of this soil-related pathway was conducted in conjunction with ingestion and dermal contact of soils.

Whenever chemicals of potential concern are detected in site soils, the potential exists for surface water to be affected by surface runoff. As appropriate, this pathway was also evaluated.

The potential exposure pathways listed in the RI for chemicals of potential concern (COPCs) in surface and near surface soil at the AFRC OU2 sites were ingestion of soil, inhalation of vapors and dust, and direct contact with the skin. Possible exposure pathways for COPCs in groundwater were ingestion, inhalation of vapors, and direct contact with skin.

Exposure conditions used in the estimation of risk were chosen to represent what is known as "reasonable maximum exposure." "The reasonable maximum exposure scenario (as described in Section 2.4.5.3 of the RI report) was evaluated according to EPA (1989) guidance, by combining the UCL (upper confidence limit on the mean) or maximum concentrations with the 90^{th} or 95^{th} percentile values of the intake variables to obtain reasonable upper bound levels of chemical exposure and risk." Use of these exposure conditions tends to overestimate risk. This effort to overestimate risk is deliberate; it provides risk managers a margin of safety when making cleanup decisions. The combination of the intake variables, expressing the exposure conditions for each receptor at each site, results in a chronic daily dose. The dose is an estimate of exposure for each pathway. Risks were then calculated by integrating chronic daily doses with chemical-specific toxicity factors established by EPA and DTSC. The toxicity values used to calculate risk and

selection criteria was conducted by the Air Force with the concurrence of the EPA Region IX toxicologist. Additional details on the risk calculations can be found in the OU2 RI.

Excess lifetime cancer risks are probabilities that are generally expressed in scientific notation (e.g., 1 x 10^{-6} or 1E-6). An excess lifetime cancer risk of 1 x 10^{-6} indicates that, as a plausible upper bound, an individual has a one in a million additional chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at a site. Guidelines for managing cancer risks are promulgated in the NCP (40 *Code of Federal Regulations* [CFR] 300.430 [e] [2] [I] [A] [2]). According to these regulations, excess carcinogenic risks between 10^{-4} and 10^{-6} may be allowable. Excess cancer risks less than 10^{-6} are generally allowable.

Potential noncarcinogenic effects of a single contaminant in a single medium are expressed as hazard quotients (HQs). By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the hazard index (HI) can be generated. The HI provides a useful reference point for gauging noncarcinogenic risks across media. EPA has also established guidelines for noncancer risks. Using these guidelines, an HI of less than 1 is generally considered protective of human health. If the HI is greater than 1, an assessment of the COPCs contributing to the HI is performed to determine whether the HI represents a noncarcinogenic human health risk above the range identified in the NCP.

The site-specific discussions below contain a brief summary of the findings of the baseline human heath risk assessment followed by the post-removal action risk evaluation.

6.1.2 Screening Risk Assessment Methodology using PRGs

The post-removal action risk evaluation was conducted using preliminary remediation goals or PRGs. As defined in EPA's 1991 *Risk Assessment Guidance for Superfund Volume 1, Part B: Development of Risk-Based Preliminary Remediation Goals,* "PRGs are goals which provide remedial design staff with long-term targets to use during analysis and selection of remedial alternatives. Ideally, the PRGs, if achieved, should both comply with applicable or relevant and appropriate requirements [i.e., maximum contaminant levels (MCLs), National Ambient Water Quality Criteria (NAWQCs), etc.] and result in residual risks that fully satisfy the NCP requirements for the protection of human health and the environment."

PRGs are concentration targets for individual chemicals for specific medium and land use combinations. There are two sources generally used for the derivation of chemical-specific PRGs: 1) concentrations based upon applicable or relevant and appropriate requirements (ARARs), and 2) concentrations based upon risk assessment or risk-based calculations. The risk-based PRGs found in EPA's *Region 9 Preliminary Remediation Goals (PRGs)* were used to evaluate risk during and after removal actions at March ARB. This approach follows the methodology discussed and approved by the Air Force, EPA, DTSC, and RWQCB, Santa Ana Region and documented in the Administrative Record.

In concurrence with the EPA Region 9 toxicologist the toxicity values used to calculate risks were selected according to EPA hierarchy established when the human health risk assessments were conducted. The hierarchy at that time was to use Integrated Risk Information System (IRIS) [tier 1], followed by Health Effect Assessment Summary Tables (HEAST) [tier 2], and then other approved sources, such as the predecessor of the Provisional Peer-Reviewed Toxicity

Values (PPRTVs) [tier 3]. The only exception was that DTSC values were used if they were more health-protective. Any resulting differences between the overall risk estimates based on DTSC- and EPA-approved toxicity values were then examined in the uncertainty analysis, if the differences affected the process of determining whether further remedial actions were necessary

6.1.3 Summary of Human Health Risks at AFRC OU2 Sites 1, 11, 37 and 39

Site 1 – Aircraft Isolation Area

Soil. The results of the baseline risk assessment for the contaminants detected in the soil prior to the removal action indicated carcinogenic risks to industrial workers and future on-site residents above the manageable risk range of 1×10^{-4} to 1×10^{-6} identified in the NCP. To mitigate these risks, a removal action was performed as previously described. Non-hazardous contaminated soil was removed from Site 1 and disposed of in the Site 6 waste cells. After completion of the excavation activities for the removal action, 18 confirmation samples were taken to confirm that any residual contamination would not pose a risk to human health.

The sampling showed residual PAH contamination. Carcinogenic risk for industrial workers at the 95% Upper Confidence Limit (UCL) of the residual concentrations is 6.9×10^{-5} (see Table 6-1) Similar risk for construction workers is 4.29×10^{-6}. Both are within the risk management range of 1×10^{-4} to 1×10^{-6}. Remedial alternatives are described in Section 7, Description of Alternatives.

Groundwater. There are no detected contaminants in the groundwater at Site 1 and modeling prior to the removal action showed no significant risk from contaminants leaching into groundwater.

Table 6-1
Carcinogenic and Non-Carcinogenic Health Risks
Following Soil Removal Activities

Site No.	Site Name	Receptor	Carcinogenic Risks	Non-Carcinogenic Health Risks
1	Aircraft Isolation Area	Future On-Site Industrial Workers	6.9×10^{-5}	*
		Future Construction Workers	4.29×10^{-6}	*
39	Abandoned Gas Station	Chemical migration from soil to groundwater	$< 10^{-6}$**	< 1**

* = not calculated

** = chemicals of potential concern either not detected (1,2-DCA, TPH-gasoline, benzene, ethylbenzene, xylene, and toluene) or substantially less than applicable EPA PRG (acetone).

Site 11 - Bulk Fuel Storage Area

Soil. The results of the baseline risk assessment indicated, if no remediation occurred, the carcinogenic risk is 2×10^{-4}, which is above the risk range identified in the NCP to future on-site residents from the soil. For industrial and construction workers, the risk is 6×10^{-5}, which is within the acceptable risk management range of 1×10^{-4} to 1×10^{-6}. Remedial alternatives are described in Section 7, Description of Alternatives

Groundwater. There are no significant detected contaminants in the groundwater at Site 11 and modeling showed no significant risk from contaminants leaching into groundwater.

Site 37 - PCB Spill at Building 317

Soil. The baseline risk assessment showed that there are no current carcinogenic or non-carcinogenic health risks from soils greater than 10^{-6} or 1, respectively. A carcinogenic risk of 2 x 10^{-5} for future residents is indicated. Future industrial and construction workers risks do not exceed 1 x 10^{-5}. However, these risks are all within the NCP acceptable risk management range of 1 x 10^{-4} to 1 x 10^{-6}. For this reason, no further action is necessary or warranted at Site 37.

Groundwater. No risks from water were identified. There are no monitoring wells at Site 37 as groundwater contamination was not suspected. None of the compounds in soil were predicted to migrate to groundwater at concentrations exceeding PRGs in less than 1,000 years.

Site 39 - Abandoned Gas Station

Soil. The baseline risk assessment showed that there are no carcinogenic or non-carcinogenic health risks from soils greater than 10^{-6} or one, respectively. Risk to future residents from the soil is significantly less than the risk from chemical migration from soil to groundwater and was not compiled separately. The alternatives evaluated to reduce the risk from chemicals predicted to migrate to groundwater (which are currently in the soil) also reduce the risk from exposure to the soil itself.

Groundwater. Non-carcinogenic health risks with an HI over one are due to elevated levels of manganese and antimony. The elevated levels of manganese and antimony are attributed to natural geologic conditions; therefore no remedial action will be required for the groundwater at Site 39 because of elevated metals concentrations.

However, modeling predicted that contaminants from the soil would migrate into the groundwater at sufficient levels to present an unacceptable risk. As an interim action, the soil was treated by bioventing. A soil boring completed in June 2000 confirmed cleanup was complete and the property is available for unrestricted use. Soil samples were taken at 20, 25 and 30 feet below ground surface and were non-detect for 1,2-DCA, TPH-gasoline, benzene, ethylbenzene, xylene and toluene (see Table 6-1). Acetone levels ranged from non-detect to 29 micrograms per kilogram (µg/kg), well below EPA Region IX PRGs (Confirmation Soil Boring Letter Report, September 2000, Admin Record Number 1647). RWQCB, Santa Ana Region confirmed closure of Site 39 in its letter dated 10 October 2000 (Admin Record number 1654). In subsequent correspondence, DTSC and EPA concurred with RWQCB's closure confirmation.

6.2 Remedial Action Objectives

The overall objective of the remedial actions for the AFRC OU2 Sites 1, 11, 37 and 39 ROD sites at March ARB is to assure that human health and the environment will be protected for current and expected future use. Soil and groundwater conditions at Sites 37 and 39 are protective of current and future industrial and residential land uses, and therefore no remedial action of groundwater is necessary or warranted.

At Sites 1 and 11, the surface soil does not meet risk-based standards for residential use, but do meet the risk-based standards for industrial land uses. There are no significant contaminants present in groundwater and modeling for Sites 1 and 11 indicates no future risk of groundwater contamination. The current and reasonable anticipated future land use at Sites 1 and 11 are industrial. In order to remain protective of human health and the environment, the remedial action objectives for Sites 1 and 11 are:

- Prevent unacceptable exposure to soil;
- Prohibit future residential-type land uses, and
- Limit access to authorized personnel.

These objectives will serve to prevent residential receptors from exposure to contaminants in surface soil above residential cleanup levels, by prohibiting construction or use for residential-type land uses at these sites and limiting access to authorized personnel.

6.3 Ecological Risk Assessment

In OU2, ecological risk was evaluated for the West March sites only. None of these sites are contained in this ROD. All of the sites in this ROD are in the Main Base area. Main Base areas are highly developed, primarily consisting of landscaping, buildings and/or pavement. These areas offer habitat to very few wildlife species compared to the open areas of rural West March.

7.0 DESCRIPTION OF ALTERNATIVES

The following sections are summaries of soil cleanup alternatives evaluated during the OU2 FS. Remedial actions were developed for those sites with identified risk above acceptable levels.

As previously discussed, some of the sites addressed in this AFRC OU2 Sites 1, 11, 37 and 39 ROD will not require action for one or more of the following reasons: (1) contamination found at the site does not pose a risk to human health or the environment; or (2) contamination has been removed and the remaining contamination is within the risk range identified in the NCP and therefore no action is necessary of warranted. The risk assessment for Site 37 shows no risk above the risk range identified in the NCP. Sampling following the removal action at Site 39 shows no risk above the risk range identified in the NCP and therefore no action is necessary or warranted. The remaining two sites (1 and 11), which have residual contamination requiring response actions, are discussed below.

Whenever the Air Force transfers real property that is subject to institutional controls and resource use restrictions to another federal agency, the transfer documents shall require that the federal transferee include the institutional controls, and applicable resource use restrictions, in its resource use plan or equivalent resource use mechanism. The Air Force shall advise the recipient federal agency of all obligations contained in the ROD, including the obligation that a State Land Use Covenant will be executed and recorded pursuant to 22 CCR Section 67391 1 in the event the federal agency transfers the property to a non-federal entity.

Whenever the Air Force proposes to transfer real property subject to resource use restrictions and institutional controls to a non-federal entity, it will provide information to that entity in the draft deed and transfer documents regarding necessary resource use restrictions and institutional controls, including the obligation that a State Land Use Covenant will be executed and recorded pursuant to 22 CCR Section 67391 1. The signed deed will include the specific institutional controls and resource use restrictions, consistent with the State Land Use covenant and this ROD.

Whenever the Air Force plans one of the transfers described above, it will, whenever possible, notify and consult with EPA and DTSC six months before such transfer to ensure that the transfer process and documents address institutional controls and resource use restrictions. If it is not possible to notify and consult with EPA and DTSC six months in advance, the Air Force shall do so as soon as possible, but not later than sixty days before transfer of such property.

7.1 Remedial Alternatives for Soil

This section discusses response actions to address the AFRC OU2 soil. Not all response actions described below were evaluated for each site. The actions evaluated for each site were selected based on site conditions. Detailed descriptions of the evaluated treatment methodologies are provided in Section 2.5 of the OU2 RI/FS. Five Year Reviews to ensure the continued protection of human health and the environment at March ARB are required. The first Five Year Review was completed in 2003, the sites 1 and 11 will be included in the next Five Year Review.

No Action.

Every site must be evaluated for the No Action Alternative as a basis for comparison of existing site conditions with other proposed alternatives. Under this alternative, no action would be taken to address soil contamination or to minimize further contaminant releases.

Land Use Controls.

Under the Land Use Controls alternative, various restrictions will be imposed on the use of the property as a means of protecting human health and the environment. The specific restrictions considered for each site are described in the following sections. The Base Engineer will document Land Use Controls in the Base Comprehensive Plan/Base General Plan (2004 or latest version). The potential Land Use Controls range from no residential type uses (any other activity allowed) to restricting the site from all use.

Land use restrictions are enforced through the dig permit system and construction review process. No construction or digging will be allowed without prior approval by the Base Engineer in the form of a dig permit or other approval as required by applicable Air Force instruction and procedures. The regulators will be notified of any significant change to the digging permit process that affects protectiveness of the remedy. The Base Engineer will not approve dig permits for activities inconsistent with the Land Use Controls. The Air Force will ensure that these or similar equivalent instructions, processes, and or requirements will be complied with for all proposed construction or surface soil disturbing activities.

The Base Environmental Protection Committee meets on a regular basis to discuss the Base's environmental responsibilities, including maintenance of Land Use Controls and any plans or projects that could negatively affect such controls. Although this periodic meeting is not a component of Land Use Controls requirements in this ROD, it will be conducted as a further means of communicating and discussing land use restrictions. Because this alternative will leave hazardous materials on site at levels not suitable for unrestricted use, a review process will be conducted at five year intervals to assure that the remedy continues to adequately protect human health. If residential cleanup standards are subsequently achieved, the Five Year Review process will no longer apply.

As part of the NPL deletion process, EPA must make the determination that the remedial action for OU2 has achieved its objectives.

The regulatory agencies may conduct inspections of operations and maintenance activities and Land Use Controls. The Air Force will continue to provide access to the property, the land use control provisions of the Base Comprehensive Plan, and documents associated with dig permit process, and construction review process relating to land use controls for these purposes.

Excavation and Low-Temperature Thermal Desorption.

In a thermal desorption process, soils are excavated and heated to volatilize and drive off contaminants to achieve cleanup levels. The volatized contaminants are destroyed in an afterburner. Contaminated soils may be heated in a screw auger dryer, a rotary kiln, of a series of externally heated distillation chambers.

Excavation and Off-base Landfill Disposal.

This alternative involves excavation of soil with contaminants above cleanup levels and disposal at a designated Treatment, Storage, and Disposal Facility (TSDF)

7.2 Site 1 – Soil

At Site 1, residual PAH contamination remains after the removal action. Following the removal action at Site 1, a building was constructed over the impacted area. Evaluation of excavation beneath the foundation of a new building was not considered appropriate and was not included for further evaluation.

The following remedial alternatives were evaluated for the residual contamination remaining:

- No Action; and
- Land Use Controls.

Description of Remedy Components

No Action. Under this alternative, the site would be unprotected and unmonitored. This alternative would not reduce the potential for exposure or contaminant migration and, therefore, would not be protective of human health and the environment under a residential land use scenario.

Land Use Controls. Under this alternative, land use prohibitions against residential construction or use, as well as public or private schools, day care centers or hospitals for human health care and limiting of access to authorized personnel would be documented in Base planning documents (e.g. Base Comprehensive Plan/Base General Plan (2004 or latest version). No construction of residential type facilities will be allowed without prior approval by the Base Engineer in the form of a dig permit or other approval as required by applicable Air Force instruction and procedures; such approvals will not be granted for residential type uses without express written approval by the regulatory agencies. Groundwater is not impacted, so no groundwater restrictions are required. The land use restrictions would come into play in the unlikely event that the existing, active runway was closed. The proximity of the site to the runway currently precludes residential use, as well as public or private schools, day care centers and hospitals for human health care. There are no current plans to close the runway. If it is closed, and a reuse proposal presented, such an action would trigger provisions of the National Environmental Policy Act (NEPA) and require an Environmental Impact Statement in accordance with 40 CFR Part 1502, thus providing the public and regulators an opportunity to consider alternative proposed uses. The Base recognizes that if at that time hazardous substances remain above unrestricted use levels, and a proposed use is inconsistent with the remedy selected herein or the related risk assumptions underlying the remedy, it will need to revisit the remedy selection made herein and seek EPA concurrence to changes in the remedy in accordance with 40 CFR 300.435 with input from the State as appropriate. Because this alternative will leave hazardous materials on site at levels not suitable for unrestricted use, a review process will be conducted at five year intervals to assure that the remedy continues to adequately protect human health. If residential cleanup standards are subsequently achieved, the Five Year Review process will no longer apply.

This alternative will not reduce contaminant toxicity, mobility or volume of contaminants. However, offsite migration is considered unlikely because of the relatively immobile nature of the contaminants.

The Chemical-Specific ARAR for Site 1 is: EPA Region IX Preliminary Remediation Goals (PRGs), which list site chemicals and corresponding residential cleanup levels for the area in which Land Use Controls will be imposed.

The Action-Specific ARARs for Site 1 are: California Civil Code section 1471, subsection (a) and (b) and California Code of Regulations (CCR), Title 22, Section 67391.1. Requirements for Land Use Covenants. Requires that appropriate measures be in place to ensure proper future land use. The specific provisions of 22 CCR Section 67391.1 that have been determined by the Air Force to currently be

relevant and appropriate requirements for the Site 1 remedy are Subsections (a), (b), (d), (e)(2), (f), and (i) of this regulation. These subsections provide that if a remedy at property owned by the government will result in levels of hazardous substances remaining on the property at levels not suitable for unrestricted use, and it is not feasible, as is the case with Site 1 to record a Land Use Covenant, then the ROD is to clearly define and include limitations on land use and other control mechanisms to ensure that future land use will be compatible with the levels of hazardous substances remaining on the property. These limitations and mechanisms are more specifically set forth elsewhere in this ROD, to include annotating the use and activity restrictions and controls in the Base Comprehensive Plan/Base General Plan (2004 or latest version), and continuing to implement review and approval procedures for any construction or ground disturbing activities at Site 1.

The ARARs are listed in Appendix C.

The cost of these controls is expected to be less than $5,000 to put into place with yearly costs of less than $5,000. Yearly costs would continue indefinitely Every five years, an additional cost of $10,000 would be incurred to prepare a Five Year Review Report. The present worth costs of the land use controls at 8% interest continuing indefinitely is $89,000

7.3 Site 11 – Soil

The following remedial alternatives were evaluated for Site 11 soils:

- No Action;
- Land Use Controls;
- Excavation and Off-base Landfill Disposal; and
- Excavation and Low-Temperature Thermal Desorption.

No Action. Under this alternative, the site would be unprotected and unmonitored. This alternative would not reduce the potential for exposure or contaminant migration and, therefore, would not be protective of human health and the environment under a residential land use scenario.

Land Use Controls. Under this alternative, land use prohibitions against residential construction or use as well as public or private schools, day care centers or hospitals for human health care, and limiting of access to authorized personnel would be recorded in Base planning documents (e.g. Base Comprehensive Plan/Base General Plan (2004 or latest version). No construction of residential type facilities will be allowed without prior approval by the Base Engineer in the form of a dig permit or other approval as required by applicable Air Force instruction and procedures; such approvals will not be granted for residential type uses without express written approval by the regulatory agencies. Groundwater is not impacted, so no groundwater restrictions are required. Because this alternative will leave hazardous materials on site at levels not suitable for unrestricted use, a review process will be conducted at five year intervals to assure that the remedy continues to adequately protect human health. Once cleanup standards have been achieved, the Five Year Review process will no longer apply.

This alternative will not reduce contaminant toxicity, mobility or volume of contaminants. However, offsite migration is considered unlikely because of the relatively immobile nature of the contaminants.

The Chemical-Specific ARAR for Site 11 is: EPA Region IX PRGs, which list site chemicals and corresponding residential cleanup levels for the area in which Land Use Controls will be imposed.

The Action-Specific ARARs for Site 11 are: California Civil Code section 1471, subsection (a) and (b) and California Code of Regulations (CCR), Title 22, Section 67391.1 Requirements for Land Use Covenants. Requires that appropriate measures be in place to ensure proper future land use. Specific provisions of 22 CCR Section 67391.1 have been determined by the Air Force to currently be relevant and appropriate requirements for the Site 11 remedy. Subsections (a), (b), (d), (e)(2), (f), and (i) of this regulation provide that if a remedy at property owned by the government will result in levels of hazardous substances remaining on the property at levels not suitable for unrestricted use, and it is not feasible, as is the case with Site 11 to record a Land Use Covenant, then the ROD is to clearly define and include limitations on land use and other control mechanisms to ensure that future land use will be compatible with the levels of hazardous substances remaining on the property. These limitations and mechanisms are more specifically set forth elsewhere in this ROD, to include annotating the use and activity restrictions and controls in the Base Comprehensive Plan/Base General Plan (2004 or latest version), and continuing to implement review and approval procedures for any construction or ground disturbing activities at Site 11.

The ARARs are listed in Appendix C.

The cost of these controls is expected to be less than $5,000 to put into place with yearly costs of less than $5,000. Yearly costs would continue indefinitely. Every five years, an additional cost of $10,000 would be incurred to prepare a Five Year Review Report. The present worth costs of the land use controls at 8% interest continuing indefinitely is $89,000.

Excavation and Off-base Landfill Disposal. This alternative would include the excavation, transport, and disposal of soil with contamination above cleanup levels to a designated offsite landfill, in compliance with 40 CFR Section 300.440. The excavation would be backfilled with clean soil. No Land Use Controls would be required if post excavation sampling indicated the remaining site soils present acceptable risk levels, which is the expected outcome for this scenario. This alternative would be protective of human heath and the environment because contaminants would be removed from the site. The soil would not be treated, and there would be no change in the volume and toxicity of the material. The material would be confined in a closed cell, and the mobility would be reduced. This alternative could be implemented in compliance with ARARs (Section 10) but costs would be high. There are no O&M costs, so the present worth cost is the same as the initial capital cost.

Total Project Cost (Present Worth)	$5,949,000
Capital Costs	$5,949,000
Total O&M Costs	$0

Excavation and Low-Temperature Thermal Desorption. This alternative involves excavation of soil with contamination above cleanup levels and treatment by thermal desorption at an offsite facility. This option would comply with ARARs (Section 10). No Land Use Controls would be required if post excavation sampling indicated the remaining site soils present acceptable risk levels, which is the expected outcome for this scenario. This alternative would provide long-term effectiveness and permanence and reduce the toxicity, mobility, and volume of contaminants. There are no operation and maintenance (O&M) costs, so the present worth cost is the same as the initial capital cost.

Total Project Cost (Present Worth)	$3,896,000
Capital Costs	$3,896,000
Total O&M Cost	$0

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8.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

Alternatives were evaluated against the nine remedy selection criteria established by CERCLA, SARA and the National Contingency Plan (NCP) §300.430(f)(5)(i). The nine criteria encompass statutory and practical factors that assist in assessing the overall feasibility and acceptability of the cleanup alternatives. The nine criteria are summarized as follows:

Overall Protection of Human Health and the Environment. This factor addresses whether each alternative provides adequate protection of human health and the environment. It also describes how risks posed through each exposure route are eliminated, reduced or controlled through treatment, engineering controls or Land Use Controls.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs). Section 121(d) of CERCLA and NCP 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs", unless such ARARs are waived under CERCLA section 121 (d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial actions, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

This criterion is used to determine whether each remedy will meet all ARARs or provide grounds for invoking a waiver of the requirements. These include chemical-, location-, and action-specific ARARs.

Long-Term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedy in maintaining protection of human health and the environment after the remedial objectives have been met. This criterion includes the consideration of residual risk that will remain onsite and the adequacy and reliability of controls.

Reduction of Toxicity, Mobility, or Volume through Treatment. This criterion addresses the anticipated performance of the specific treatment technologies under a given alternative.

Short-Term Effectiveness. This criterion addresses the effectiveness of alternatives in protecting human health and the environment during the construction and implementation of a remedy until the remedial action is complete.

Implementability. This criterion addresses the technical and administrative feasibility of alternatives from design through construction and operation. Factors such as the availability of required goods and services, and coordination with other government agencies are also considered.

Cost. This criterion addresses the capital and operations and maintenance (O&M) costs incurred with each alternative.

State Acceptance. This criterion considers whether the State concurs with, opposes, or has no comment on the Selected Remedy.

Community Acceptance. This criterion indicates whether community concerns are addressed by each cleanup method and whether the community has indicated a preferred cleanup method.

8.1 Comparative Analysis of Alternatives

This section presents the results of comparative analyses of remedial alternatives performed for sites where further control of contamination is required.

8.1.1 Site 1 - Soil

A comparative analysis was completed using the alternatives and criteria previously identified. The alternatives for the soil remediation are:

- No Action; and
- Land Use Controls.

Groundwater would not be impacted by contaminant migration at this site.

Overall Protection of Human Health and the Environment. The No Action alternative would not provide for overall protection of human health and the environment under a residential land use scenario. Chances of ingestion of soil and inhalation of dust particles would remain at current levels since the contaminated soil remains untreated. The site is currently fenced, access is restricted, and exposures may therefore be over-estimated. The Land Use Controls alternative would provide for overall protection of human health and the environment by restricting access and prohibiting residential-type land use. Risk of ingestion of surface soil or inhalation of surface dust particles would be limited under this alternative. Risk would be minimized by imposing restrictions preventing future residential-type land use, and by limiting access to the site to authorized personnel. Land use restrictions will be specified in the Base Comprehensive Plan/Base General Plan (2004 or latest version) along with the reasons for restrictions, i.e., PAH contaminated soils. Additionally, existing risk is within acceptable levels. For Site 1, risks are within the acceptable risk management range for all of the evaluated receptors (off-site current industrial workers and future on-site industrial and construction workers), except for residential receptors.

Because the "No Action" alternative is not protective of human health and the environment under a residential land use scenario, it was eliminated from consideration under the remaining eight criteria.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs). The Land Use Controls alternative would comply with limited provisions of Title 22 CCR 67391.1 Requirements for Land Use Covenants, by restricting land use to only those uses that are suitable for the levels of

hazardous materials remaining on the site, and by imposing controls through the dig permit and construction review process.

Long-Term Effectiveness and Permanence. The Land Use Controls alternative would annotate the land use restrictions for long-term effectiveness and permanence.

Reduction of Toxicity, Mobility, or Volume through Treatment. Land Use Controls alternatives would not reduce the toxicity, mobility, and volume of contaminants since no treatment is implemented under these alternatives.

Short-Term Effectiveness. Land Use Controls would not raise any short-term effectiveness concerns because no disturbance of affected surface soils will occur and the remedy is protective in the short-term.

Implementability. Land Use Control alternatives are easy to implement.

Cost. The Land Use Control alternative is cost-effective with low initial and recurring costs.

State Acceptance. The State of California was actively involved in the RI/FS and remedy selection process. The State also concurred with the underlying remedy as presented in the Proposed Plan. Final acceptance will occur in the approved ROD.

Community Acceptance. The public comment period for the Proposed Plan was from August 25, to October 8, 2003. In addition, a public meeting was held on September 18, 2003. The Proposed Plan also contained Sites 2, 8, 27 and 36 in addition to the sites in this ROD. Representatives of the Air Force and EPA attended the public meeting to address questions. No public comments were received, indicating acceptance. A Responsiveness Summary is included as Appendix A.

8.1.2 Site 11 - Soil.

A comparative analysis was completed using the alternatives and criteria previously identified. The alternatives are:

- No Action;
- Land Use Controls;
- Excavation and Off-base Landfill Disposal; and
- Excavation and Off-base Incineration.

Groundwater would not be impacted by contaminant migration at this site.

The release at Site 11 has been determined through the remedial investigation to involve a petroleum product release from an above ground jet fuel tank. Such releases are excluded from the CERCLA definitions of hazardous substances, pollutants, and contaminants (42 USC § 9601 (14) and (33)) Such releases are covered by and subject to the State Underground Storage Tank Law Title 23, California Code of Regulations, Division 3, Chapter 16. 23 CCR Section 2721, Health & Safety Code (H&SC) Section 25295 of Chapter 6.7, and 40 CFR 280.67 for underground storage tanks and California Aboveground Petroleum Storage Action with 1991 Amendments - H&SC Section 25270 - 25270.13 for aboveground tanks authorizes the RWQCB to utilize the substantive and procedural processes and requirements of another federal or state law in lieu of this law if it determines that such law provides equivalent human health and environmental protection and public participation and the agency

agrees/concurs with the remedy selected under the other legal regime. The State has made this determination and has concurred with the remedy selected in this ROD.

Overall Protection of Human Health and the Environment. The No Action alternative would not provide for overall protection of human health and the environment under a residential land use scenario. Chances of ingestion of soil and inhalation of dust particles would remain at current levels since the contaminated soil remains untreated. The site is currently fenced, access is restricted, and exposures may therefore be over-estimated. The Land Use Controls alternative would provide for overall protection of human health and the environment by restricting access and prohibiting residential-type use. Risk of ingestion of surface soil or inhalation of surface dust particles would be limited under this alternative. Risk would be minimized by imposing restrictions preventing future residential-type land use, and by limiting access to the site to authorized personnel. Land use restrictions will be specified in the Base Comprehensive Plan/Base General Plan (2004 or latest version) along with the reasons for restrictions, i.e., PAH contaminated soils. For Site 11, risks are within the acceptable risk management range for all of the evaluated receptors (current and future industrial workers and future construction workers), except for residential receptors.

Excavation and off-base disposal would provide adequate protection of human health by removing the source. No treatment would take place. Elimination of the source would reduce the risk of inhalation of the dust particles or ingestion of soil. Excavation and thermal desorption would protect human health by treating the contaminated soil, and exposures to contaminants would be reduced to acceptable levels.

Because the "No Action" alternative is not protective of human health and the environment under a residential land use scenario, it was eliminated from consideration under the remaining eight criteria.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs). The Excavation and Off-base Disposal and Excavation and Low Temperature Thermal Desorption alternatives would comply with the ARARs identified for this site. The Land Use Controls alternative would comply with ARARs by restricting land use to only those uses that are suitable for the levels of hazardous materials remaining on the site, and by imposing controls through the dig permit process.

Long-Term Effectiveness and Permanence. The Land Use Controls alternative would annotate the land use and activity restrictions for long-term effectiveness and permanence. The Excavation and Off-base Disposal and Excavation and Low Temperature Thermal Desorption alternatives would provide for long-term effectiveness although only the Excavation and Thermal Desorption alternative would provide permanent treatment.

Reduction of Toxicity, Mobility, or Volume through Treatment. Land Use Controls alternatives would not reduce the toxicity, mobility, and volume because no treatment would be implemented. Excavation and Off-base Disposal would reduce the toxicity, mobility, and volume of the contaminants by removing the contaminants from Site 11. This alternative, however, does not treat the contaminants. Therefore, no permanent toxicity or volume reduction would occur. Only Excavation and Thermal Desorption would reduce toxicity, mobility, and volume of the contaminants through treatment.

Short-Term Effectiveness. Land Use Controls would not raise any short-term effectiveness concerns because no disturbance of affected surface soils would occur. In the Excavation and Off-base Disposal and Excavation and Low-Temperature Thermal Desorption alternatives, worker protection during excavation, transportation and treatment would pose a minor concern. Engineering controls (i.e., dust suppression, hearing protection) could be used to protect workers and, therefore, the short-term risk are

judged to be controllable Community risks from the transport of the soils, either on-base or offsite, are considered negligible. Low temperature thermal desorption may result in emissions of contaminated air However, these emissions can easily be controlled.

Implementability. Excavation and Off-base Disposal would involve excavation of affected soil and backfilling of the excavated areas where Excavation and Thermal Desorption would also involve treatment. No sophisticated equipment or materials would be needed to implement these alternatives. Construction and safety procedures during construction would be quite simple, and there are a number of experienced contractors who could perform this type of work. Construction delays are unlikely. Land Use Controls are easy to implement.

Cost. The Land Use Controls alternative is the most cost-effective, with a present worth cost of $89,000 (see Section 7.3). Thermal desorption and off-base disposal have very high costs, at $3,896,000 and $5,949,000, respectively.

State Acceptance. The State of California was actively involved in the RI/FS and remedy selection process The State also concurred with the underlying remedy as presented in the Proposed Plan Final acceptance will occur in the approved ROD.

Community Acceptance. The public comment period for the Proposed Plan was from August 25, to October 8, 2003. In addition, a public meeting was held on September 18, 2003. The Proposed Plan also contained Sites 2, 8, 27 and 36 in addition to the sites in this ROD. Representatives of the Air Force and EPA attended the public meeting to address questions. No public comments were received, indication acceptance. A Responsiveness Summary is included as Appendix A.

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9.0 SELECTED REMEDIES

The selected soil remedies specify Land Use Controls to restrict access and prohibit construction or use of residential-type uses. Land Use Controls will no longer be needed once residual levels allow for unlimited use and unrestricted exposure.

9.1 Cleanup Standards and Goals

Section 9.1.1 presents soil cleanup goals, established from risk-based PRGs (surface soil), which list site chemicals and corresponding cleanup levels for the area in which Land Use Controls are considered.

9.1.1 Soil Cleanup Goals

The goal of soil cleanup is twofold: to protect human health by preventing exposure to contaminated soils; and to prevent degradation of groundwater from contaminants migrating downward through the soil. Cleanup levels necessary to meet these goals were determined from two soil zones: surface soil (0-2 feet below ground surface) and subsurface soil (from the ground surface to groundwater level). For the surface soil interval, cleanup goals were based on EPA Region IX PRGs and the results of human health risk assessments. Section 9.1.2 discusses cleanup of surface soil. For subsurface soil, the goals were evaluated using the results of computer modeling. For the sites of concern in this AFRC OU2 Sites 1, 11, 37 and 39 ROD, the modeling determined no subsurface clean up is required.

9.1.2 Surface Soil Cleanup Goals

Surface soil cleanup goals are based on EPA Region IX PRGs. Region IX PRGs are considered appropriate cleanup goals for surface soils because they consider the expected exposure pathways and scenarios at March ARB. The Region IX PRG is based on the 10^{-6} carcinogenic risk level, conservatively within the 10^{-4} to 10^{-6} level specified in the NCP. Additionally, these goals are not being used to consider impact to groundwater. Both residential and industrial PRGs were used to assess the need for surface soil cleanup. Residential PRGs are considered more protective of human health than industrial PRGs. Residential PRGs were determined to be appropriate for Sites 37 and 39. Industrial PRGs, were used for Sites 1 and 11 to set remediation standards for the reasons given in the site specific discussions.

The following is a discussion, by site, of the chemicals exceeding EPA Region IX PRGs. Table 9-1 presents concentrations of chemicals that exceed EPA Region IX residential and industrial PRGs.

Site 1. Benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene were found in Site 1 surface soils at concentrations exceeding EPA Region IX PRGs. Most affected soil was removed and disposed in the Site 6 waste cell. Although some PAHs remain at the site (Table 9-1), the removal action has reduced risks to a level compatible with industrial land use with risks less than 10^{-4} to industrial and construction workers based on 95 percent UCL concentrations. Table 9-1 includes residential and industrial PRG values for 1998 (the date applicable to the risk assessment) and current 2004 PRGs. Although some change is reflected in the PRG values between these timeframes, they remain within an order of magnitude and thus the overall risk findings are not significantly changed.

Table 9-1
Concentrations of Surface Soil Contaminants Exceeding
EPA Region IX PRGs

Site	Chemical	Maximum Conc. at Site (mg/kg)	95% Upper Confidence Limit on the Mean (mg/kg)	1998 EPA Region IX Residential PRG (mg/kg)	1998 EPA Region IX Industrial PRG (mg/kg)	2004 EPA Region IX Residential PRG (mg/kg)	2004 EPA Region IX Industrial PRG (mg/kg)
1	Benz(a)anthracene	7.2	1.5	0.56	3.6	0.62	2.1
1	Benzo(a)pyrene	7.1	1.5	0.056	0.36	0.062	0.21
1	Benzo(b)fluoranthene	6.3	1.5	0.56	3.6	0.62	2.1
1	Benzo(k)fluoranthene	7.2	1.6	0.56	3.6	0.38	1.3
11	Benzo(a)pyrene	0.15	0.6	0.056	0.36	0.062	0.21
37	Aroclor 1260	2.8	0.017	0.2	1.3	0.22	0.74

Industrial land use PRGs were used to determine the need for cleanup at Site 1 for the following reasons:

- Site 1 is located in an area retained by the Air Force to which the public does not have access;
- It is unlikely that Site 1 will be used for residential purposes in the future since it adjacent to aircraft taxiways, within the clear zone of the runway and surrounded by industrial facilities;
- Much of the area showing residual PAHs has been covered by a concrete foundation, blocking soil contact and production of PAH contaminated dust; and
- Land Use Controls prohibiting residential-type use and limiting access to authorized personnel will be included in Base Comprehensive Plan/Base General Plan (2004 or latest version), along with the reason for controls (i.e. elevated PAHs).

Site 11. Benzo(a)pyrene was the only chemical found at concentrations greater than EPA Region IX residential PRG. The same chemical was also identified with a potential risk within the range of 10^{-4} to 10^{-6} to current and future industrial workers and future residents. Industrial land use PRGs were used to determine the need for cleanup at Site 11 for the following reasons:

- Site 11 is located in an area retained by the Air Force to which the public does not have access;
- It is unlikely that Site 11 will be used for residential purposes in the future since it is currently a fuel farm, surrounded by industrial facilities (on base) and commercial facilities (off base); and
- Land Use Controls prohibiting residential-type use and limiting access to authorized personnel will be included in Base Comprehensive Plan/Base General Plan (2004 or latest version), along with the reason for controls (i.e. elevated PAHs).

Site 37. Risk levels to future residents and industrial workers were 10^{-5} to 10^{-6}, which is within the acceptable 10^{-4} to 10^{-6} risk range.

Site 39. Risk levels to current and future industrial and construction workers and future residents were well below the acceptable risk range of 10^{-4} to 10^{-6}; therefore no action is necessary or warranted.

documents address institutional controls and resource use restrictions. If it is not possible to notify and consult with EPA and DTSC six months in advance, the Air Force shall do so as soon as possible, but not later than sixty days before transfer of such property

The following measures related to Land Use Controls will apply to Sites 1 and 11

(1) The Base Comprehensive Plan/Base General Plan (2004 or latest version) will incorporate the specific Land Use Controls required at Site 1 and 11 based on the presence of residual levels of PAHs that exceed residential PRGs in surface soil. The Base Comprehensive Plan/Base General Plan will also contain a map indicating all areas where contaminated soil is located, the type of contamination and what Land Use Controls are in effect for each of those areas.

The Base Comprehensive Plan/Base General Plan (2004 or latest version) implements "zone-like" requirements at March ARB. Air Force installations require this comprehensive planning document for the establishment and maintenance of the Land Use Controls. The Base Comprehensive Plan/Base General Plan (2004 or latest version) currently resides in the office of the Base Civil Engineer.

The AF will make the land use control sections of the current and any revision of the Base Comprehensive Plan/Base General Plan available to regulatory agencies upon request. The AF will provide the regulators 30 days notice of any changes to the land use control provisions of the Base Comprehensive Plan/Base General Plan

(2) The Air Force will notify the regulators at least six (6) months in advance of any land sale, transfer of property, or land lease, that is subject to use restrictions in accordance with CERCLA Section 120(h) If it is not possible for the facility to notify the regulators at least six months prior to any transfer or sale, then the Air Force will notify the regulators as soon as possible but no later than 60 days prior to the sale, transfer, or lease. The Air Force further agrees to provide the regulators with similar notice, within the same time frames, as to federal to federal transfer of property accountability and administrative control of the ERP Site. Review and comment opportunities afforded to the regulators as to such federal to federal transfers shall be in accordance with all applicable federal laws. The Air Force will provide EPA and the State of California a copy of the executed deed or transfer assembly.

(3) The Air Force shall not modify or terminate Land Use Controls, implementation actions, or modify land use without approval by EPA and the State of California. The Air Force shall seek prior concurrence before any anticipated action that may disrupt the effectiveness of the Land Use Controls or any action that may alter or negate the need for Land Use Controls.

The Air Force shall notify EPA and DTSC within 45 days in advance of any proposed land use changes that are inconsistent with land use control objectives or the selected remedy

(4) The Air Force will notify the regulators via e-mail or telephone as soon as practicable, but no later than two weeks after discovery of any activity that is inconsistent with the Land Use Controls, or any action that may interfere with the effectiveness of the Institutional Controls, and shall provide what corrective measures have been taken or are planned

(5) The Air Force will conduct annual monitoring of the Land Use Controls and undertake prompt action to address activity that is inconsistent with the Land Use Controls. Annual monitoring will include review of the land use control provisions of the Base Comprehensive Plan/Base General Plan, dig permitting process, construction review procedures, and any other relevant land use control provisions

9.2 Selected Remedies

The Air Force is responsible for implementing, maintaining, monitoring, reporting, and enforcing the remedial actions (including institutional controls) identified herein for the duration of the remedies selected in this ROD. It will exercise this responsibility in accordance with CERCLA and the NCP. Upon completion of active remediation at a site, and if hazardous substances remain in the soil above unrestricted use levels, the Air Force will update the Base General Plan to include the site-specific use restrictions including the expected duration of the Land Use Controls, if needed The Land Use Controls shall be maintained until the concentration of hazardous substances in the soil have been reduced to levels that allow for unlimited use and unrestricted exposure.

The specific provisions of 22 CCR § 67391.1 that have been determined by the Air Force to be relevant and appropriate requirements for the OU2 selected remedy are subsections (a), (b), (d), and (e)(2), (f) and (i). These subsections, along with California Civil Code section 1471, subsections (a) and (b), and EPA Region IX Preliminary Remediation Goals (PRGs) are Applicable or Relevant and Appropriate Requirements (ARARs) for this OU2 Sites 1, 11, 37 and 39 ROD. These subsections provide that if a remedy at property owned by the federal government will result in levels of hazardous substances remaining on the property at levels not suitable for unrestricted use, and it has been determined that it is not feasible, as is the case with OU2, to record a State Land Use Covenant, mechanisms other than a State Land Use Covenant may be used to ensure land use will be compatible with the levels of hazardous substances that remain. Such situations include restrictions on the use of property for which the federal government remains the owner or for transfers of property from one federal agency to another.

These possible mechanisms include amendments to the facility master plan, physical monuments or agreements between the federal government and DTSC. The Record of Decision is to clearly define and include limitations on land use and other institutional control mechanisms to ensure that current and future land use will be compatible with the levels of hazardous substances remaining on the property. These limitations and mechanisms are more specifically set forth items (1) through (7) below, to include annotating the use and activity restrictions and controls in the Base Comprehensive Plan/Base General Plan (2004 or latest revision), and continuing to implement review and approval procedures for any construction and ground disturbing activities in OU2, as long as the Air Force continues to be the property owner.

Whenever the Air Force transfers real property that is subject to institutional controls and resource use restrictions to another federal agency, the transfer documents shall require that the federal transferee include the institutional controls, and applicable resource use restrictions, in its resource use plan or equivalent resource use mechanism. The Air Force shall advise the recipient federal agency of all obligations contained in the ROD, including the obligation that a State Land Use Covenant will be executed and recorded pursuant to 22 CCR Section 67391.1 in the event the federal agency transfers the property to a non-federal entity.

Whenever the Air Force proposes to transfer real property subject to resource use restrictions and institutional controls to a non-federal entity, it will provide information to that entity in the draft deed and transfer documents regarding necessary resource use restrictions and institutional controls, including the obligation that a State Land Use Covenant will be executed and recorded pursuant to 22 CCR Section 67391.1. The signed deed will include the specific institutional controls and resource use restrictions, consistent with the State Land Use covenant and this ROD.

Whenever the Air Force plans one of the transfers described above, it will, whenever possible, notify and consult with EPA and DTSC six months before such transfer to ensure that the transfer process and

specified in this ROD. The Air Force will submit to the regulatory agencies an annual monitoring report on the status of the Land Use Controls and how any deficiencies or inconsistent uses have been addressed. The report will not be subject to approval and/or revision by the regulatory agencies. The annual monitoring reports will be used as part of the Five Year Review to evaluate the effectiveness of the remedy. The Five Year Review report will make recommendations on the continuation, modification, or elimination of annual reports and Land Use Control monitoring frequencies. The Five Year Review report will be submitted to the regulatory agencies for review and comment.

(6) The Air Force will implement, monitor, maintain, and enforce Land Use Controls in accordance with CERCLA and the NCP. The Air Force Land Use Controls will be maintained until the concentration of hazardous substances in soil are at such levels to allow for unrestricted and unlimited exposure. The Five Year Review process will be used to document when cleanup standards that allow for unlimited use and unrestricted exposure have been achieved.

(7) Land use restrictions are enforced through the dig permit system. No construction or digging will be allowed without prior approval from the Base Engineer in the form of a dig permit or other approval as required by applicable Air Force instruction and procedures. The Air Force will ensure that these or similar equivalent instructions, processes, and or requirements will be complied with for all proposed construction or surface soil disturbing activities at Sites 1 and 11. The Base Engineer will not approve dig permits for activities inconsistent with the Land Use Controls.

Specific language is included in this ROD regarding implementation, monitoring, and enforcement of the selected ICs Therefore, compliance with the terms of this ROD will be protective of human health and the environment. Because the restrictions are specifically described in Section 9 and the means for implementing the restrictions are detailed in Section 7, it is not necessary for the Air Force to submit any new post-ROD, IC implementation documents, such as a Land Use Control Implementation Plan (LUCIP), a new O&M plan or a Remedial Action (RA) work plan. The existing Base Comprehensive Plan should be revised to include the restrictions.

As part of the NPL deletion process, EPA must make the determination that the remedial action for OU2 has achieved its objectives. In this case, because the OU2A remedy consists of ICs only, EPA's determination that the remedy is protective will be made based on the IC annual monitoring reports, so long as adequate information is provided in the report

The ICs Alternatives include various enforceable use restrictions and land use controls on the use of the property. The Air Force is responsible for implementing, maintaining, monitoring reporting, and the enforcement of the remedial actions (including institutional controls). The Air Force will exercise this responsibility in accordance with CERCLA and the National Contingency Plan (NCP).

Annual Evaluations/Monitoring

The Air Force will conduct annual monitoring and undertake prompt action to address activity that is inconsistent with the IC objective or use restrictions, exposure assumptions or any action that may interfere with the effectiveness of the ICs. Annual monitoring will include review of the land use control provisions of the Base Comprehensive Plan/Base General Plan, dig permitting process, construction review procedures, and any other relevant land use control provisions specified in this ROD. The Air Force will submit to the regulatory agencies annual monitoring report on the status of the ICs and how any IC deficiencies or inconsistent uses have been addressed. The IC monitoring reports will not be subject to approval and/or revision by the regulatory agencies. The annual monitoring reports will be used as part of the Five Year Review to evaluate the effectiveness of the remedy The Five Year Review

report will make recommendations on the continuation, modification, or elimination of annual reports and IC monitoring frequencies. The Five Year Review report will be submitted to the regulatory agencies for review and comment. The regulatory agencies may conduct inspections of operations and maintenance activities and ICs at Sites 1 and 11.

9.3 Selected Remedy for Site 1 – Aircraft Isolation Area

Current use of Site 1 is industrial. The selected remedy for Site 1 is Land Use Controls, consisting of a prohibition of residential type uses, to prevent exposure to PAH contamination existing in surface soils at the site and limiting access to the Site to authorized personnel. The Land Use Controls apply to the Site 1 area shown in Figure D-1. Specifically, construction or use of Site 1 for residences, public or private schools, day care centers, or hospitals for human care will be prohibited. The Land Use Controls alternative is described in Sections 7.2 and 8.1.1. This selected remedy for Site 1 is subject to the CERCLA Five Year Review requirement.

The Base Comprehensive Plan/Base General Plan (2004 or latest version) will incorporate the specific use restrictions required at Site 1, including prohibiting construction or use for residential type uses such as residences, public or private schools, day care centers, or hospitals for human care, and limiting access to the Site to authorized personnel. Sections of the Base Comprehensive Plan/Base General Plan (2004 or latest version) related to Land Use Controls will be provided to the regulators within six months of ROD signature. Unapproved use will be prevented by the dig permit program procedures (AFI 32-1001, Operations Management, 1 Aug 99) described in Section 7.1.

9.4 Selected Remedy for Site 11 – Bulk Fuel Storage Area

Current use of Site 11 is industrial. The selected remedy for Site 11 is Land Use Controls, consisting of a prohibition of residential type uses, to prevent exposure to PAH contamination existing in surface soils at the site and limiting access to the Site to authorized personnel. The Land Use Controls apply to the Site 11 area shown in Figure D-1. Specifically, construction or use of Site 11 for residences, public or private schools, day care centers, or hospitals for human care will be prohibited. The Land Use Controls alternative is described in Sections 7.3 and 8.1.2. This selected remedy for Site 11 is subject to the CERCLA Five Year Review requirement.

The Base Comprehensive Plan/Base General Plan (2004 or latest version) will incorporate the specific use restrictions required at Site 11, including prohibiting construction or use for residential type uses, such as residences, public or private schools, day care centers, or hospitals for human care, and limiting access to the Site to authorized personnel. Sections of the Base Comprehensive Plan/Base General Plan (2004 or latest version) related to Land Use Controls will be provided to the regulators within six months of ROD signature. Unapproved use will be prevented by the dig permit program procedures (AFI 32-1001, Operations Management, 1 Aug 99) described in Section 7.1.

9.5 Selected Remedy for Site 37

The selected remedy for Site 37 is no action. Contaminated soil was removed after the reported spill (see Section 5.2.3) and the site was re-sampled. The risk assessment for Site 37 shows no risk above the risk range identified in the NCP, and therefore no action is necessary or warranted.

9.6 Selected Remedy for Site 39

The selected remedy for Site 39 is no action. Due to a previous removal action, there are no remaining unacceptable risks to human health or the environment; the risk assessment for Site 39 shows no risk above the risk range identified in the NCP, and therefore no action is necessary or warranted. In addition, Site 39 has received regulatory closure from RWQCB, Santa Ana Region (10 Oct 00, Administrative Record number 1654), with concurrence from DTSC (17 Oct 00, Administrative Record number 1657) and EPA (17 Oct 00, Administrative Record number 1656).

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10.0 STATUTORY DETERMINATIONS

Under the authority delegated to it by Executive Order 12580, the Air Force and EPA are selecting remedial actions at these sites with the concurrence of the State, that achieve protection of human health and the environment Under CERCLA §121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements (unless a statutory wavier is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element and a bias against off-site disposal of untreated wastes The following sections discuss how the selected remedies meet these statutory requirements.

10.1 Site 1 Soil – Land Use Controls

Protection of Human Health and the Environment. The selected remedy protects human health and the environment by limiting exposure to residual contamination by the method discussed in Section 9 3 Principal threats identified during the OU2 RI were addressed in the removal action The controls on residential land use will eliminate the threat of exposure via direct contact or ingestion. The Air Force will enforce the procedures for protection of the site.

Compliance with Applicable or Relevant and Appropriate Requirements. The selected remedy will comply with all ARARs (refer to Appendix C)

Cost Effectiveness. In the judgment of the Air Force, the selected remedy is cost-effective and represents a reasonable value for the money spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness" (NCP §300 430(f)(1)(ii)(D)). This was accomplished by evaluating the "overall effectiveness" of those alternatives that satisfied the threshold criteria of protectiveness of human health and the environment and compliance with ARARs Overall effectiveness was evaluated by assessing, in combination, long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and thus this alternative represents a reasonable value for the money to be spent. The annual and long term cost of Land Use Controls shows this alternative to be a cost-effective method of controlling exposures at Site 1.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable. The selected remedy does not utilize permanent solutions or alternative treatment technologies, but appropriately balances those considerations with relative costs and other relevant criteria.

The prior removal action reduced constituent concentrations in surface soils to levels acceptable for industrial land use The selected remedy achieves the objective of preventing exposures via prohibiting residential land use while allowing industrial use of the site. The selected remedy satisfies the long-term effectiveness criteria by ensuring no exposures over levels protective of human health. The selected remedy does not present short-term risk and there are no implementability issues

Preference for Treatment as a Principal Element. A removal action was completed such that existing concentration levels present acceptable risks for industrial land use of the site. Land Use Controls restricting residential land use will be protective of human health and the environment.

Five Year Review Requirement. Because the remedy will result in soil contamination remaining on the site above levels that allow for unlimited use and unrestricted exposure, a statutory review of this site will be conducted as part of the ongoing CERCLA Five Year Review to ensure that the remedy remains protective of human health and the environment. If cleanup standards that allow for unlimited use and unrestricted exposure are subsequently achieved, the Five Year Review will no longer apply because hazardous substances will not remain above health based levels. The Five Year Review process will be used to document when cleanup standards that allow for unlimited use and unrestricted exposure have been achieved.

10.2 Site 11 Soil – Land Use Controls

Protection of Human Health and the Environment. The selected remedy protects human health and the environment by limiting exposure to residual contamination by the method discussed in Section 9.3. The controls on residential land use will eliminate the threat of exposure via direct contact or ingestion. The Air Force will enforce the procedures for protection of the site.

Compliance with Applicable or Relevant and Appropriate Requirements. The selected remedy will comply with all ARARs (refer to Appendix C).

Cost Effectiveness. In the judgment of the Air Force, the selected remedy is cost-effective and represents a reasonable value for the money spent. The annual cost of Land Use Controls shows this alternative is a cost effective way of controlling exposures at Site 11. The excavation and off-base disposal or low temperature thermal desorption alternatives are significantly more expensive (each over $3 million dollars) than the initial and long term cost of Land Use Controls, and would allow unrestricted use of the site. However, the current and expected future use is industrial and the additional expense would not return a reasonable value for the money spent. The method for this determination was as discussed in Section 10.1 above.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable. The selected remedy does not utilize permanent solutions or alternative treatment technologies, but appropriately balances those considerations with relative costs and other relevant criteria.

The prior removal action reduced constituent concentrations in surface soils to levels acceptable for industrial land use. The selected remedy achieves the objective of preventing exposures via prohibiting residential land use while allowing industrial use of the site. The selected remedy satisfies the long-term effectiveness criteria by ensuring no exposures over levels protective of human health. The selected remedy does not present short-term risk and there are no implementability issues. The excavation and off-base disposal or low temperature thermal desorption alternatives would provide a permanent solution, but costs are significant.

Preference for Treatment as a Principal Element. The selected remedy does not satisfy the statutory preference of remedies that employ treatment as a principal element. The residual contamination

remaining after the removal action cannot be practicably removed and treated. Therefore, limiting exposures by Land Use Controls is appropriate

Five Year Review Requirement. Because the remedy will result in soil contamination remaining on the site above levels that allow for unlimited use and unrestricted exposure, a statutory review of this site will be conducted as part of the ongoing CERCLA Five Year Review to ensure that the remedy remains protective of human health and the environment. Once cleanup standards that allow for unlimited use and unrestricted exposure have been achieved, the Five Year Review will no longer apply because hazardous substances will not remain above health based levels. The Five Year Review process will be used to document when cleanup standards that allow for unlimited use and unrestricted exposure have been achieved.

10.3 Sites 37 and 39 Soil

Due to previous interim removal actions conducted at Sites 37 and 39, there are no remaining unacceptable risks to human health or the environment, allowing for unrestricted use and unlimited exposure, and therefore no further action is necessary or warranted.

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APPENDIX A – RESPONSIVENESS SUMMARY

A public meeting was held on the AFRC OU2 Proposed Plan on September 18, 2003. Fourteen people attended. No comments were received on the AFRC OU2 sites or proposed remedies.

The written comment period ended on October 8, 2003. No written comments were received.

APPENDIX B – ADMINISTRATIVE RECORD INDEX

A copy of the Administrative Record Index is available on request. The Administrative Record is located in Bldg 2407 at March ARB.

APPENDIX C – ARARS

Requirement	ARAR Status	Source	Description
Action Specific			
Land Use Covenant	Relevant and Appropriate	CCR, title 22, section 67391.1 (a)	Requires imposition of appropriate limitations on land use by recorded land use covenant when hazardous substances remain on the property at levels that are not suitable for unrestricted use of the land.
Land Use Covenant	Relevant and Appropriate	CCR, title 22, section 67391.1 (b)	Requires that the cleanup decision document contain an implementation and enforcement plan for land use limitations.
Land Use Covenant	Relevant and Appropriate	CCR, title 22, section 67391.1 (d)	Requires that the land use covenant be recorded in the county where the land is located.
Land Use Covenant	Relevant and Appropriate	CCR, title 22, section 67391 1 (e) (2)	Use of other mechanisms to record land use restrictions on federal property.
Land Use Covenant	Relevant and Appropriate	CCR, title 22, section 67391.1 (f)	Use of other mechanisms to record land use restrictions.
Land Use Covenant	Relevant and Appropriate	CCR, title 22, section 67391.1 (i)	Definitions
Land Use Covenant	Relevant and Appropriate	CA Civil Code Section 1471(a) and (b)	Specifies requirements for land use covenants to apply to successors in title to the land.

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